Vol. 8, No. 20
October 31, 1983

Energy Research Abstracts

Abstracts 48506-50449

Technical Information Center
UNITED STATES DEPARTMENT OF ENERGY

CURRENT AWARENESS PUBLICATIONS ON ENERGY

To provide complete coverage of literature related to major Department programs, announcement publications that are comprehensive in their coverage of certain energy fields are issued regularly. All information in these publications, plus additional backup information, is included in the Energy Data Base of the Technical Information Center; all references are also available for machine searching via the on-line retrieval system, DOE/RECON, and the commercial on-line retrieval systems. Descriptions of these current awareness publications, which are supported either directly or indirectly by the DOE, appear below. Department of Energy components may receive the listed publications free from the Technical Information Center, P.O. Box 62, Oak Ridge, TN 37830. Telephone (615) 576-1303; (FTS) 626-1303.

PUBLICATIONS OF THE TECHNICAL INFORMATION CENTER

Energy Abstracts for Policy Analysis (EAPA)

A monthly abstract journal devoted to the analysis of energy research, conservation, and policy. Scope and coverage are limited to substantive articles or reports and emphasize the following: programmatic efforts; legislative, regulatory, and other legal aspects; social, economic, and environmental impacts; regional and sectoral analyses; institutional factors, etc. *EAPA* is available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402; domestic subscribers $6.00, foreign $7.50 per copy; annual cumulative index, domestic $10.00, foreign $12.50 per copy. The annual subscription price is $70.00 for domestic subscribers and $87.50 for foreign subscribers.

Energy Research Abstracts (ERA)

A comprehensive semimonthly abstract journal devoted to all areas of energy-related information produced by the Department of Energy, other U. S. government organizations, and foreign governments. *ERA* is available to the public on a subscription basis from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402. The subscription rate for the 24 semimonthly issues is $165.00 for domestic subscribers and $206.25 for foreign subscribers. A single issue costs $9.50 (domestic) or $11.90 (foreign).

The following publications are available to the public on a subscription basis from the National Technical Information Service (NTIS), Springfield, Virginia 22161. The annual subscription rate for one volume (calendar) year (12 issues plus cumulative index) is $75.00 for domestic subscribers and $150.00 for subscribers outside the North American continent, except as listed below for *DOE Patents Available for Licensing (PAL)*. A single issue is $7.00 (domestic) and $14.00 (outside the North American continent).

Current Energy Patents (CEP)

A monthly publication providing abstracting and indexing coverage of the international patent literature, including patent applications, that concerns any aspect of energy production, conservation, and utilization. Available as PB83-902800.

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A monthly abstract journal devoted to information on the processing and use of fossil fuels. Available as PB83-914600.

Fusion Energy Update (CFU)

A monthly abstract journal devoted to information on controlled thermonuclear research. Available as PB83-915300.

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A monthly abstract journal devoted to information on the utilization of solar energy, including biomass and tidal and wind power. Available as PB83-914500.

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A semimonthly current awareness bulletin covering all aspects of the nuclear fuel cycle, both front end and back end. Available as PB83-913400.

Nuclear Reactor Safety (NRS)

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Radioactive Waste Management (RWM)

A semimonthly current awareness bulletin covering the following management aspects: transport and storage, waste processing, waste disposal, waste storage, radioactive effluents, and shipping containers. Available as PB83-902900.

INTERNATIONAL ENERGY PUBLICATIONS

The Technical Information Center cooperates with the following organizations in the publication of international abstract journals: (1) International Atomic Energy Agency, International Nuclear Information System, Vienna, Austria, for *Atomindex;* (2) International Energy Agency, IEA Coal Research, London, England, for *Coal Abstracts;* and (3) International Energy Agency, Biomass Conversion Technical Information Service, Dublin, Ireland, for *Biomass Abstracts*. In each case, the cognizant foreign agency provides the non-U.S. information to TIC for inclusion in the Energy Data Base; in turn, TIC provides the U.S. information for input into the respective journal.

Atomindex

A semimonthly abstract journal providing worldwide coverage of information on nuclear science and technology. *Atomindex* is available by subscription from UNIPUB, 345 Park Avenue South, New York, NY 10010. The cost of an annual subscription, 24 semimonthly issues and semiannual and annual cumulative indexes, is $290.

Biomass Abstracts

A bimonthly abstract journal with comprehensive coverage of information in any step involved in the eventual conversion of biomass to energy. *Biomass Abstracts* is available free to Department of Energy components and contractors from the Technical Information Center. Non-DOE organizations may obtain *Biomass Abstracts* from Biomass Conversion Technical Information Service, Institute for Industrial Research and Standards, Ballymun Road, Dublin 9, Ireland, for 42 IR pounds per year. Make checks payable to the Institute.

Coal Abstracts

A monthly abstract journal providing comprehensive worldwide coverage of information in the field of coal science and technology. *Coal Abstracts* is available to Department of Energy components and contractors from the Technical Information Center. Non-DOE organizations may obtain *Coal Abstracts* from IEA Coal Research, Technical Information Service, 14-15 Lower Grosvenor Place, London SW1W 0EX, England, for 100 pounds sterling per year.

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ENERGY RESEARCH ABSTRACTS

ABOUT THE TECHNICAL INFORMATION CENTER

The Technical Information Center in Oak Ridge, Tennessee, has been the national center for scientific and technical information for the Department of Energy (DOE) and its predecessor agencies since 1946. In developing and managing DOE's technical information program, the Center places under bibliographic control not only DOE-originated information but also worldwide literature on scientific and technical advances in the energy field and announces the source and availability of this information. Whereas the literature of science is emphasized, coverage is extended to DOE programmatic, socioeconomic, environmental, legislative/regulatory, energy analysis, and policy-related areas. To accomplish this mission, the Center builds and maintains computerized energy-information data bases and disseminates this information via computerized retrieval systems and announcement publications such as abstracting journals, bibliographies, and update journals. Direct access to the Center's most comprehensive data base, the Energy Data Base, is available to the public through commercial on-line bibliographic retrieval systems. The Energy Data Base and many of the Center's energy-related data bases are available to DOE offices and contractors and to other government agencies via DOE/RECON, the Department's on-line information retrieval system. The Center has developed and maintains systems to record and communicate energy-related research-in-progress information, to maintain a register of DOE public communications publications, to track research report deliverables from DOE contractors, and to test and make available DOE-funded computer software programs with scientific and management applications. The Center also maintains a full-scale publishing capability to serve special publication needs of the Department. To effectively manage DOE's technical information resources, the Center's program is one of continual development and evaluation of new information products, systems, and technologies.

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ABOUT *ENERGY RESEARCH ABSTRACTS*

Energy Research Abstracts (ERA) provides abstracting and indexing coverage of all scientific and technical reports, journal articles, conference papers and proceedings, books, patents, theses, and monographs originated by the U. S. Department of Energy, its laboratories, energy centers and contractors. *ERA* also covers other energy information prepared *in report form* by federal and state government organizations, foreign governments, and domestic and foreign universities and research organizations. The user should remain aware that *ERA* coverage of non-report literature is limited to that generated by Department of Energy activity.

ERA is comprehensive in its subject scope, encompassing the DOE's research, development, demonstration, and technological programs resulting from its broad charter for energy sources, supplies, safety, environmental impacts, and regulation.

ERA is available on an exchange basis to universities, research institutions, industrial firms, and publishers of scientific information. Inquiries should be directed to the Technical Information Center, P. O. Box 62, Oak Ridge, Tennessee 37830.

ERA is available to the public on a subscription basis from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402. The subscription rate for the 24 semimonthly issues is $165.00 for domestic subscribers and $206.25 for foreign subscribers. A single issue costs $9.50 (domestic) or $11.90 (foreign). The cumulative indexes will be available in printed form from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402, and in microfiche form from the National Technical Information Service, U. S. Department of Commerce, Springfield, Virginia 22161, and from Engineered Systems, P. O. Box 866, Oak Ridge, Tennessee 37830.

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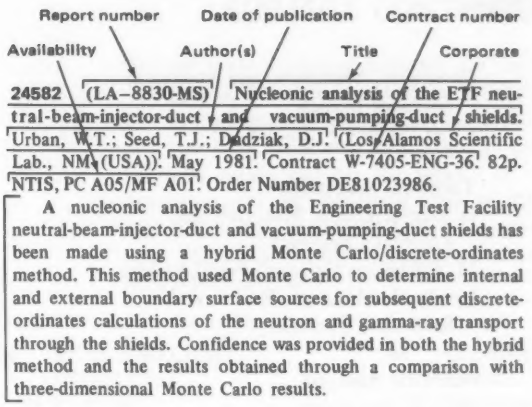
ABSTRACTS IN *ENERGY RESEARCH ABSTRACTS*

The principal elements of abstract entries for a typical research and development report and a typical technical journal article are illustrated below.


Report number
Date of publication
Contract number
Availability
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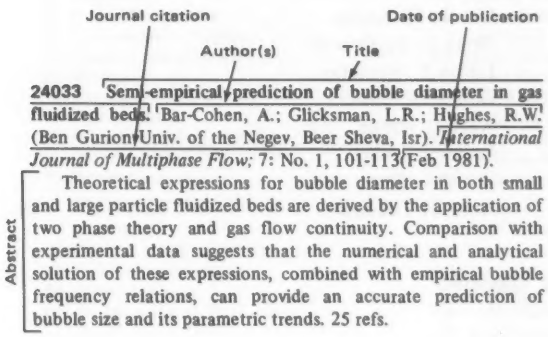
Corporate
24582 (LA–8830-MS) Nucleonic analysis of the ETF neutral-beam-injector-duct and vacuum-pumping-duct shields. Urban, W.T.; Seed, T.J.; Dudziak, D.J. (Los Alamos Scientific Lab., NM (USA)). May 1981. Contract W-7405-ENG-36. 82p. NTIS, PC A05/MF A01. Order Number DE81023986.
Abstract
A nucleonic analysis of the Engineering Test Facility neutral-beam-injector-duct and vacuum-pumping-duct shields has been made using a hybrid Monte Carlo/discrete-ordinates method. This method used Monte Carlo to determine internal and external boundary surface sources for subsequent discrete-ordinates calculations of the neutron and gamma-ray transport through the shields. Confidence was provided in both the hybrid method and the results obtained through a comparison with three-dimensional Monte Carlo results.


Journal citation
Date of publication
Author(s)
Title
24033 Semi-empirical prediction of bubble diameter in gas fluidized beds. Bar-Cohen, A.; Glicksman, L.R.; Hughes, R.W. (Ben Gurion Univ. of the Negev, Beer Sheva, Isr). International Journal of Multiphase Flow; 7: No. 1, 101-113 (Feb 1981).
Abstract
Theoretical expressions for bubble diameter in both small and large particle fluidized beds are derived by the application of two phase theory and gas flow continuity. Comparison with experimental data suggests that the numerical and analytical solution of these expressions, combined with empirical bubble frequency relations, can provide an accurate prediction of bubble size and its parametric trends. 25 refs.

INDEXES TO *ENERGY RESEARCH ABSTRACTS*

Five indexes are provided for approaching the contents of each issue of *Energy Research Abstracts (ERA)*. Each index is preceded by an introduction that details the organization of the index and the principles by which it was compiled. The reader is referred to these introductions for information not found in the index examples that follow.

• Corporate Author Index

Technical report literature is indexed using the name of the organization or institution responsible for the issuance of the report.

24582 (LA–8830-MS) Nucleonic analysis of the ETF neutral-beam-injector-duct and vacuum-pumping-duct shields. Urban, W.T.; Seed, T.J.; Dudziak, D.J. **(Los Alamos Scientific Lab., NM (USA)).** May 1981. Contract W-7405-ENG-36. 82p. NTIS, PC A05/MF A01. Order Number DE81023986.

is indexed as:

Los Alamos Scientific Lab., NM (USA)
Nucleonic analysis of the ETF neutral-beam-injector-duct and vacuum-pumping-duct shields, 6:24582 (R:US)

• Personal Author Index

Each author's name is indexed in the form appearing on the document abstracted, with the exception that given names are reduced to initials:

Bar-Cohen, A., Semi-empirical prediction of bubble diameter in gas fluidized beds, 7:24033 (J:US)
Dudziak, D.J., *See* Urban, W.T., 6:24582
Glicksman, L.R., *See* Bar-Cohen, A., 7:24033
Hughes, R.W., *See* Bar-Cohen, A., 7:24033
Seed, T.J., *See* Urban, W.T., 6:24582
Urban, W.T., Nucleonic analysis of the ETF neutral-beam-injector-duct and vacuum-pumping-duct shields, 6:24582 (R:US)

• Subject Index

The subject index consisting of entries naming specific materials, objects, and processes is arranged alphabetically. Document titles, informative phrases, or both specific to these entries are arranged alphabetically under the entries.

TOKAMAK ETF
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• Contract Number Index

DOE technical literature is indexed using contract numbers under which the literature was produced. This index contains the contract number with corresponding abstract and report numbers.

W-7405-ENG-36	**Los Alamos National Lab., NM (USA)**	
	6:24582	LA–8830-MS

• Report Number Index

Technical report literature is also indexed using report numbers. This index includes information on where individual reports may be obtained. Patents and conference papers are indexed here as a matter of convenience. When a report is supplied under an Order Number, that number is included in the availability statement. An Order Number–Report Number Correlation is included for convenience.

LA–		
8830-MS	6:24582	NTIS, PC A05/MF A01. Order Number DE81023986, Distribution Category STD-20d

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SUBJECT CONTENTS (NUMERICAL LISTING)

Six-digit subject category numbers are used in the storage, retrieval, and manipulation of bibliographic information entered into DOE's computerized bibliographic information system. The six-digit category numbers are utilized as if they were three pairs of two-digit numbers, the first two pairs being used to arrange the abstract content of *Energy Research Abstracts*. The following listing includes the totality of the 40 first-level and 294 second-level subject categories used. Because each issue of *ERA* announces only those documents becoming available during a semimonthly period, some subject categories may not be represented in every issue. The complete subject category scheme with scope notes is available as DOE/TIC-4584-R4 from NTIS for $7.00.

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SUBJECT CONTENTS (ALPHABETICAL LISTING)

Six-digit subject category numbers are used in the storage, retrieval, and manipulation of bibliographic information entered into DOE's computerized bibliographic information system. The six-digit category numbers are utilized as if they were three pairs of two-digit numbers, the first two pairs being used to arrange the abstract content of *Energy Research Abstracts*. The following listing includes the totality of the 40 first-level and 294 second-level subject categories used. Because each issue of *ERA* announces only those documents becoming available during a semimonthly period, some subject categories may not be represented in every issue. The complete subject category scheme with scope notes is available as DOE/TIC-4584-R4 from NTIS for $7.00.

33 ADVANCED AUTOMOTIVE PROPULSION SYSTEMS
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ENERGY RESEARCH ABSTRACTS

01 COAL AND COAL PRODUCTS

48506 (DFE—58) Energy research program 1978/79-1980/81. Survey of the performance of the peat line. Kjellstroem, B. (Delegationen foer Energiforskning, Stockholm (Sweden)). Sep 1982. 156p. (In Swedish). NTIS (US Sales Only), PC A07/MF A01. Order Number DE83750980.

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This critical review presents the projects concerning research, development and demonstration which were completed during the period. Preparation for the production on a large scale and to using peat for firing the boilers of industrial heating centers has started. The amount of available peat supplies has been evaluated and varous methods of peat utilization have been studied. The studies of environmental effects are at a preliminary stage. The infromation seems to be adequate to motivate a use of peat from 6 to 11 TWh the year 1990. A long term estimate of the place of peat in energy systems is not yet possible. The advice from the industry is anticipated. It is recommended that future development should take place by means of an institution. This organisation will take care of national and international information services as well.

0104 Processing

REFER ALSO TO CITATION(S) 48540, 48545, 48546, 48547, 48549, 48584, 48769, 48771, 49448, 50068

48507 (DOE/ER/10721—T2) Radical chain and rearrangement reactions in coal liquefaction. Progress report. Gajewski, J.J.; Gilbert, K.E. (Indiana Univ., Bloomington (USA). Dept. of Chemistry). [nd]. Contract AC02-80ER10721. 8p. NTIS, PC A02/MF A01. Order Number DE83016557.

In our initial proposal we suggested that models for cleavage of the three atom links in coal liquefaction would be 1,3-diphenylpropane,1, dibenzylether,2, and phenethylphenylether,3. It was suggested that these could decompose by free radical chain processes involving B-scisson reactions. These reactions should be of great interest because they, potentially, may occur over a wide temperature range which might lead to lower temperature liquefaction processes. We established the free radical chain nature for the decomposition of 1, 2 and 3. We were able to show, by product studies, kinetics and by initiation, that 1, 2 and 3 all decompose by self-initiated free radical chain reactions involving B-scission and hydrogen transfer as the propagation steps. The activation parameters for these reactions are compatible with their occurring during liquefaction. More recently these studies have been extended down to 80°C with the development of low temperature methods for initiating reaction. Some of the more interesting findings include the fact that 1,3-diphenylpropane, the all carbon three atom link, does not react with any initiators below 300°C. This can be attributed to a thermodynamic barrier to reaction, and suggests that liquefaction processes, based on the thermal free radical cleavages of all-carbon systems, will not proceed at lower temperatures. Dibenzylether and phenethylphenylether will decompose at lower temperature with 2 reacting as low as 138°, and 3 reacting as low as 200°C. This difference in reactivity is due to kinetic barriers to hydrogen transfer to and cleavage of the chain carrying radicals 2 or 3. Thus, cleavage of carbon-oxygen linkages in coal are more appropriate to study.

48508 (DOE/ET/14700—15) Chemistry and catalysis of coal liquefaction: catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels. Quarterly progress report, April-June 1983. Wiser, W.H. (Utah Univ., Salt Lake City (USA). Dept. of Mining and Fuels Engineering). Jul 1983. Contract AC22-79ET14700. 121p. NTIS, PC A06/MF A01. Order Number DE83015792.

Among the highlights to date is the fact that kinetic studies of catalytic functions have revealed that the overriding deactivation of catalysts used in the H-coal process is due to coke deposits and not metal deposits. Significant deactivation occurs early with the recycle oil used prior to introduction of coal. Thus, the catalyst loses appreciable activity even before coal is processed. However, the catalyst can be successfully reactivated at this stage by a simple air regeneration. Other projects are considered in some detail also.

48509 (DOE/PC/30075—14) Crossed reaction networks in the catalytic hydrodenitrogenation of synthetic liquid fuels. Quarterly report, May 1, 1983-July 31, 1983. Satterfield, C.N.; Smith, C.M.; Ingalls, M. (Massachusetts Inst. of Tech., Cambridge (USA)). 1983. Contract AC22-80PC30075. 23p. NTIS, PC A02/MF A01. Order Number DE83015479.

We reported that, in the absence of H_2S, the rate of HDN of quinoline was enhanced by addition of H_2O and this was rapidly reversible when the H_2O was removed. When H_2S is present, the addition of H_2O again increases the HDN rate but most of the increase is maintained for a long period after the H_2O is removed. These studies were done on a catalyst that previously had been on stream for over 400 hours in the absence of H_2S. Similar runs have been performed on a new batch of catalyst (No. 10) differing from the previous runs in that a much shorter deactivation period was used before the effects of H_2S and H_2O addition were studied. As before, with H_2S present, the further addition of H_2O increased % HDN, but this time the effect was rapidly reversible when the H_2S was removed. The % HDN increased with partial pressure of water vapor, in contrast to an earlier study in the presence of H_2S in which H_2O at 0.3 kPa enhanced HDN but presumed higher concentrations (produced from ethyl phenol) had no further enhancing effect. In the absence of H_2S the % HDN increased with water concentration. Evidently there are complex interactions between H_2O, H_2S and the catalyst that can significantly affect the rate of HDN. After presulfiding, carrying out the HDN reaction in the absence of added CS_2 for a substantial period of time (e.g., 150 hours or more) seems to affect the way in which the catalyst responds to added H_2O.

48510 (DOE/PC/30252—T11) Hydrogen bonding in asphaltenes and coal liquids. Quarterly report, May 1-July 31, 1983. Li, N.C.; Yaggi, N.F.; Loeffler, M.C. (Duquesne Univ., Pittsburgh, PA (USA). Dept. of Chemistry). 1983. Contract AC22-80PC30252. 25p. NTIS, PC A02/MF A01. Order Number DE83016180.

It has been demonstrated that hydrogen bonding is very important in defining the high viscosity of coal-derived liquids. The objective of this study was to investigate the nature and strength of hydrogen bonding between the acid and base fractions of SRC II middle distillates. Amberlite IRA-904 and Amerlyst A-15 were used as anion-exchange and cation-exchange resins respectively, to separate coal-derived products into various acid and base fractions. Formation constants of hydrogen bonding between the acid and base fractions were determined by infrared spectroscopy. It appears that the Acid-II and Base-II fractions behave as hydrogen bond donors and acceptors, comparable to p-cresol (unhindered phenol) and quinoline-type nitrogen bases respectively.

48511 **(DOE/PC/40785—8) Exploratory study of coal-conversion chemistry. Quarterly report No. 8, February 19, 1983-May 18, 1983.** Ross, D.S.; McMillen, D.F.; Ogier, W.C.; Chang, S.J.; Hum, G.P.; Mansani, R.; Green, T.K. (SRI International, Menlo Park, CA (USA)). Jun 1983. Contract AC22-81PC40785. 37p. NTIS, PC A03/MF A01. Order Number DE83016166.

In Subtask A.3 the correlation between hydrogen-transfer promoted bond cleavage (solvent-mediated hydrogenolysis) in coal-model compounds and donor-solvent thermochemical parameters has been quantified and extended to the pyrene/dihydropyrene system. The results are in general, but not exact, agreement with the thermochemical analysis, which predicts sequential five-fold and three-fold increases in solvent-mediated hydrogenolysis on moving from 9,10-dihydroanthracene to 9,10-dihyrophenanthrene and 4,5-dihydropyrene. This analysis assumes that the solvent system provides the radical steady-state concentration. The possible additional effects of high initial concentrations of thermally generated coal radicals are discussed in light of the peculiarities of the pyrene system. Our efforts in Task B Conversion in CO/H_2O Systems were concentrated on Subtask B.2 this quarter. We initiated studies using D_2O/CO in place of H_2O/CO. Conversion of coal was enhanced in D_2O/CO under an equivalent CO conversion. We propose a rationale to account for this solvent isotope effect. Initial interpretation of the NMR work on the D_2O/CO products show that deuterium is preferentially incorporated into benzylic structural positions. These results are similar to other NMR studies using d_{12}-tetralin and D_2 as conversion medium. Appendixes A and B have been entered separately.

48512 (DOE/PC/40785—8, pp A.1-A.6) **Mechanisms of hydrogen transfer and associated bond cleavage reactions: a rationalization of the effectiveness of pyrene in coal liquefaction solvents.** McMillen, D.F.; Ogier, W.C.; Chang, S.J.; Fleming, R.H.; Malhotra, R. (SRI International, Menlo Park, CA). Jun 1983. NTIS, PC A03/MF A01.

In Exploratory study of coal-conversion chemistry. Quarterly report No. 8, February 19, 1983-May 18, 1983.

In summary, model compound studies and kinetic analyses have suggested that the effectiveness of pyrene as a hydrogen-transfer agent in coal liquefaction is due to its increased effectiveness in solvent mediated hydrogenolyses which is due in turn to (1) its relatively high stability among 4-ring aromatics, and (2) the inability of the most predominant radical in the system to terminate as readily as those in other systems. This explanation will be tested by extending to the pyrene system our studies of bond scission promoted by hydrogen-transfer (solvent-mediated hydrogenolysis), and by spiking coal liquefaction mixtures with model coal linkages subject to such hydrogenolysis to determine if, under actual coal liquefaction conditions, the scission of such structures is accelerated in pyrene.

48513 (DOE/PC/40785—8, pp B.1-B.4) **Coal conversion in supercritical water systems.** Ross, D.S. (SRI International, Menlo Park, CA); Green, T.K.; Mansani, R. (SRI International, Menlo Park, CA). Jun 1983. NTIS, PC A03/MF A01.

In Exploratory study of coal-conversion chemistry. Quarterly report No. 8, February 19, 1983-May 18, 1983.

Supercritical water as a medium for coal conversion offers several advantages over conventional donor solvent media. These advantages include: synthesis gas ($CO + H_2$) can be used in place of the more expensive H_2; the solvent can be easily recycled with virtually no deterioration of the solvent quality; product separation can be accomplished with relative ease. The liquids that are produced can be extracted into the supercritical water and are easily separated from the solid products; soluble hydrogenation catalysts that are otherwise insoluble in organic media can be impregnated (or precipitated) onto the coal surface and into its interstices in the supercritical region. This practice eliminates the need for a hydrogen transfer agent. The catalyst can then be dissolved from the coal residue in the subsequent subcritical region, which allows it to be recycled. The feasibility of aqueous conversion processes was first demonstrated by Appell and coworkers. Hydrogen was observed to be much less effective than carbon monoxide. We also compared the conversion of PSOC-1098 in CO/H_2O and in CO/D_2O under otherwise identical conditions. It is clear that the conversion of coal is enhanced in the CO/D_2O system compared to the CO/H_2O system. We can account for this by hypothesising that k_2 is decreased relative to k_1 when D_2O is substituted for H_2O. By slowing Reaction 2, the steady state concentration of the active CO intermediate is increased, and therefore more coal is converted under an equivalent CO conversion. If this hypothesis is correct, then the larger isotopic effect observed for k_2 suggest that this pathway is more importantly controlled by the rate of dissociation of either a C-H(D) or a O-H(D) bond than the other pathway. Although we have no complete mechanistic picture at this time, this observation can provide some insight into the conversion chemistry to be developed in further studies.

48514 **(DOE/PC/50041—22) Wilsonville Advanced Coal Liquefaction Research and Development Facility, Wilsonville, Alabama. Topical report No. 10, thermal stress analysis.** (Catalytic, Inc., Wilsonville, AL (USA)). Aug 1983. Contract AC22-82PC50041. 75p. NTIS, PC A04/MF A01. Order Number DE83016798.

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The thermal dissolver, the main reactor of the SRC unit, has suffered a recurring problem. Specifically, it has been observed that whenever the reactor vessel is cooled to below 400°F, its bottom head gasket leaks. An analysis of the thermal stress induced in the gasket, owing to transients across the bottom head flange, was sought. The analysis was facilitated by judiciously dividing a symmetric section of the reactor into 79 differential elements. Heat balances have been developed around each element. A numerical technique, the backward finite-difference approach, was employed to obtain the thermal behavior across the bottom head flange as a function of reactor heat-up time. The analysis performed affords an explanation for the failure of the gasket. Based on results of this work, recommendations have been suggested to provide the gasket and bolt stress requirements that are necessary to avoid leaks due to temperature changes.

48515 **(ESG-DOE—13405) Advancement of peat hydrogasification. Final report, July 1983.** Garey, M.P.; Rosemary, J.K. (Rockwell International Corp., Canoga Park, CA (USA). Energy Systems Group; Lummus Co., Bloomfield, NJ (USA)). Jul 1983. Contract AC18-81FC10500. 207p. NTIS, PC A10/MF A01. Order Number DE83016149.

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This final technical report summarizes the results of a preliminary conceptual commercial-scale peat hydrogasification plant study performed for the US Department of Energy by the Energy Systems Group of Rockwell International and its subcontractor, the C.E. Lummus Company. The plant design is based on the Rockwell single-stage, entrained flow, short-residence-time hydrogasifier in which peat and hot hydrogen are reacted to produce SNG and a high-value co-product liquid, predominantly chemical-grade benzene. The overall design objective was to integrate the Rockwell hydrogasifier with a combination of unit operations and plant subsystems to yield an effective and economic plant for producing 250 billion Btu per stream day of pipeline quality SNG from peat. The report is divided into two parts. Part I contains a summary of the work performed by Rockwell in support of the Lummus plant design effort. Rockwell provided to Lummus correlations of reactor performance data, cost and design information pertaining to the reactor train, specifications of equipment requirements for the peat drying and pulverization system, and preliminary material balances for an alternate plant design based upon the use of a partial oxidation gasifier system for hydrogen generation. Lummus performed the major part of this study. Their final report to Rockwell is presented in its entirety as Part II of this document. Included are the design and economic bases for the commercial-scale plant concept, detailed descriptions of the selected process configurations, and preliminary order of magnitude estimates for the capital requirements, the net annual operating costs, and an average cost of gas for the proposed plant design. The Lummus section and a review article on peat have been entered separately. (LTN)

48516 (ESG-DOE—13405, pp 119p, Paper 1) **Peat hydrogasification plant. Preliminary design study for a 250 MMM Btu per day SNG plant. Predesign report.** Jul 1983. NTIS, PC A10/MF A01.

In Advancement of peat hydrogasification. Final report, July 1983.

The Lummus Company was awarded a contract, Number N278-020ZKX by Rockwell International Corporation to prepare a preliminary conceptual design of a commercial plant which would manufacture substitute natural gas using the Cities Service/Rockwell hydrogasification process. The design objective was to integrate the Rockwell single-stage, short-residence-time (SRT) hydrogasifier with a combination of unit operations and plant subsystems to yield an effective and economic plant for producing 250 billion Btu per stream day pipeline quality SNG from peat. This preliminary conceptual design report presents a description of the proposed process configuration developed under the above referred contract. A preliminary order-of-magnitude estimate for the capital requirements, the net annual operating costs, and an average cost of gas for the proposed conceptual design has also been prepared.

48517 (ORNL/TM—8836) **Effects of hydrotreatment on the properties of coal-derived liquid products: a status report.** Dumont, J.N.; Epler, J.L; Regan, J.D.; Russell, L.B.; Witschi, H.R. (Oak Ridge National Lab., TN (USA)). Aug 1983. Contract W-7405-ENG-26. 103p. NTIS, PC A06/MF A01. Order Number DE83016396.

Products from coal liquefaction facilities contain many compounds such as polycyclic aromatic hydrocarbons, aromatic amines, nitrogen-and-sulfur-containing heterocyclic compounds, phenols, and trace metal compounds that are known or suspected to be carcinogenic, mutagenic, teratogenic, or toxic. Biological activity has been identified in product materials derived from PDU and pilot plant operations, which are considered generically representative of raw materials that might be produced by demonstration or commercial-scale facilities. Exploratory research studies have indicated that hydrotreatment reduces significantly the biological response and ecological hazard of these generic liquid products. The Oak Ridge National Laboratory (ORNL) has been asked by the Office of Fossil Energy, the US Department of Energy to assist in a systematic study of coal-derived liquids which are upgraded. The approach to upgrading in this program was in part a result of research at ORNL and the Battelle Pacific Northwest Laboratory which showed hydrotreatment effective for reducing mutagenicity and other biological and ecological properties. Experience at these and other laboratories has shown it to be essential to generate data on the chemical properties of the samples to assist in interpretation of bioassay results. This report summarizes the current status of an interdivisional program evaluating the effectiveness of hydrotreatment in reducing the biological response and ecological hazard of coal liquids derived from the SRC-II, Exxon Donor Solvent (EDS), and H-coal processes. Although the program is continuing and the full set of data are not yet available, the considerable set of results generated to date clearly demonstrate the beneficial effects of hydrotreatment.

48518 (PB—83-217877) **Electron transfer and ion pair formation during oxidation and gasification of coal. Annual report Feb 82-Feb 83.** Camaioni, D.M. (Battelle-Northwest, Richland, WA (USA). Pacific Northwest Lab.; Gas Research Inst., Chicago, IL (USA)). Mar 1983. 35p. NTIS, PC A03/MF A01.

This report describes the first year's work of a research project directed towards developing basic knowledge relating to the reactions of aromatic radical cations and hydroxyl radical adducts of coal structures, by studying radical cation and hydroxyl radical mediated oxidations of model compounds.

48519 (PB—83-218131) **Microbiological and chemical studies on the anaerobic conversion of coal-derived compounds to methane. Annual report Feb 82-Feb 83.** Ferry, J.G.; Winans, R.E. (Virginia Polytechnic Inst. and State Univ., Blacksburg (USA); Argonne National Lab., IL (USA); Gas Research Inst., Chicago, IL (USA)). Mar 1983. 24p. NTIS, PC A02/MF A01.

A combined chemical and biological approach for the conversion of coal to methane at ambient temperatures was investigated. Coal was solubilized to water soluble products that were evaluated for their biodegradability to methane by mixed cultures of anaerobic bacteria. Several pure aromatic compounds known to be present in coal oxidation products, were converted to methane by microbial consortia derived from natural habitats. Mixtures of coal oxidation products were not converted to methane by microbial populations (consortia) found in nature. However, the oxidation products did not inhibit methane formation from other substrates. These results suggest that the biological potential exists for the conversion of coal oxidation products to methane. Adaptation of natural microbial communities may be necessary to develop consortia that degrade coal oxidation products.

48520 (PNL—4202-App.A-D) **Aquatic Pathways Model to predict the fate of phenolic compounds. Appendixes A through D.** Aaberg, R.L.; Peloquin, R.A.; Strenge, D.L.; Mellinger, P.L. (Pacific Northwest Lab., Richland, WA (USA)). Apr 1983. Contract AC06-76RL01830. 134p. NTIS, PC A07/MF A01. Order Number DE83016661.

Organic materials released from energy-related activities could affect human health and the environment. We have developed a model to predict the fate of spills or discharges of pollutants into flowing or static bodies of fresh water. A computer code, Aquatic Pathways Model (APM), was written to implement the model. The APM estimates the concentrations of chemicals in fish tissue, water and sediment, and is therefore useful for assessing exposure to humans through aquatic pathways. The major pathways considered are biodegradation, fish and sediment uptake, photolysis, and evaporation. The model has been implemented with parameters for the distribution of phenols, an important class of compounds found in the water-soluble fractions of coal liquids. The model was developed to estimate the fate of liquids derived from coal. Current modeling efforts show that, in comparison with many pesticides and polyaromatic hydrocarbons (PAH), the lighter phenolics (the cresols) are not persistent in the environment. For the twelve phenolics studied, biodegradation appears to be the major pathway for elimination from aquatic environments. A pond system simulation of a spill of solvent-refined coal (SRC-II) materials indicates that phenol, cresols, and other single cyclic phenolics are degraded to 16 to 25 percent of their original concentrations within 30 hours. Adsorption of these compounds into sediments and accumulation by fish was minor. Results of a simulated spill of a coal liquid (SRC-II) into a pond show that APM predicted the allocation of 12 phenolic components among six compartments at 30 hours after a small spill. The simulation indicated that most of the introduced phenolic compounds were biodegraded. The phenolics remaining in the aquatic system partitioned according to their molecular weight and structure. A substantial amount was predicted to remain in the water, with less than 0.01% distributed in sediment or fish.

48521 (SAND—83-0891C) **Monitoring of the Tono Project partial-seam CRIP UCG experiment using the CSAMT technique.** Bartel, L.C.; Davidson, G.S.; Jacobson, R.D. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 15p. (CONF-830827—5). NTIS, PC A02/MF A01. Order Number DE83016502.

From 9. annual symposium on underground coal gasification; Bloomingdale, IL, USA (7 Aug 1983).

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The controlled source audio-frequency magnetotelluric (CSAMT) technique will be used to monitor an underground-coal-gasification (UCG) experiment. The UCG experiment will be conducted in late summer of 1983 at the Washington Irrigation and Development Co. (WIDCO) property near Centralia, WA. Previous field experiments, mapping the Hanna II, Phases 2 and 3 and the Rawlins T-2 UCG cavities, indicate that the CSAMT technique is capable of mapping an active UCG process. It is expected that a CSAMT monitoring system will give one-meter resolution of the width of the process. The data-acquisition system (hardware and software), measurement philosophy, model calculations of expected results, pre-test CSAMT data, and overall system design are discussed. 10 figures, 1 table.

48522 (SAND—83-1396) **Coal-liquefaction-process research. Quarterly report, January 1-March 30, 1983.** Chapman, R.N.; Lynch, A.W.; Padrick, T.D.; Stephens, H.P.; Stohl, F.V. (Sandia National Labs., Albuquerque, NM (USA)). Aug 1983. Contract AC04-76DP00789. 38p. NTIS, PC A03/MF A01. Order Number DE83016418.

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This quarterly report summarizes activities in Sandia National Laboratories' continuing program of research on direct coal liquefaction. The program, composed of two projects - Advanced Concepts for Multistage Coal Liquefaction and Catalyst Studies in Coal Liquefaction - has as its overall goals to provide an understanding of the mechanisms and kinetics of primary and secondary reactions in coal liquefaction; to explore advanced concepts for multistage processing; and to determine the effect of process variables on catalyst deactivation. Work was performed on: short-contact-time liquefaction experiments with Wyodak coal using hydrogenated cresote oil and 1,2,3,4-tetrahydroquinoline as solvents; the construction and testing of the continuous flow microreactor for studying catalyst deactivation; the determination of the effects of temperatures, pressure and catalyst on the kinetics of pyrene hydrogenation; the evaluation of a coal slurry reactor/rheometer for the determination of slurry viscosity changes during coal dissolution; the analysis of coke and metals in catalyst samples dissolution; the analysis of coke and metals in catalyst samples from the Wilsonville pilot plant; the evaluation of sintering effects in H-Coal catalyst samples; and the design of an atmospheric pressure model compound testing unit. Appendix A was entered separately.

48523 (SAND—83-1396, pp 29-37) **Kinetics of catalytic hydrogenation of pyrene: implications for direct coal liquefaction processing.** Stephens, H.P.; Chapman, R.N. (Sandia National Labs., Albuquerque, NM). Aug 1983. NTIS, PC A03/MF A01.

In Coal-liquefaction-process research. Quarterly report, January 1-March 30, 1983.

Although recycling heavy solvents has recently re-emerged as a key to cutting the cost of direct coal liquefaction, little data for the hydrogenation of heavy solvent donors have been reported. This study addresses the kinetic and thermodynamic aspects of catalytic hydrogenation of pyrene, a donor solvent precursor thought to play an important role in coal liquefaction processes that used heavy recycle solvents. In the presence of a catalyst, pyrene (Py) is hydrogenated to di- (H_2Py), tetra- (H_4Py), hexa- (H_6Py), deca- ($H_{10}Py$) (Figure 1) and perhydro- ($H_{16}Py$) species via a complex mechanism involving a network of reversible parallel and series reactions. Though several studies have dealt with aspects of pyrene hydrogenation including hydrocracking reactions, reaction product distributions, and thermodynamic properties, the kinetics of hydrogenation have not been previously reported. Qualitative aspects of the kinetics of pyrene hydrogenation may be obtained from curves of concentration vs time, at constant temperature and pressure, for the major species of the system. Figure 2 shows curves at 348°C and 1250 psig for the concentration of pyrene and 4,5-dihydropyrene (H_2Py) and Figure 3 for 4,5,9,10-tetrahydropyrene (H_4Py), 1,2,3,6,7,8-hexahydropyrene (H_6Py) and 1,2,3,3a,4,5-hexahydropyrene (I-H_6Py). As can be seen from the figures, the hydrogenated specie with the largest concentration is H_2Py followed by H_6Py, H_4Py and I-H_6Py. For these experiments, the concentration of deca- and perhydropyrenes was less than 1% of the product mixture. The kinetics and thermodynamics of the formation of 4,5-dihydropyrene are discussed below with respect to the effect of catalyst/pyrene ratio, hydrogen pressure and temperature.

48524 (UCRL—50026-83-1) **LLNL underground coal gasification project. Quarterly progress rreport, January through March 1983.** Stephens, D.R.; Shissler, W.C. (eds.). (Lawrence Livermore National Lab., CA (USA)). 9 May 1983. Contract W-7405-ENG-48. 10p. NTIS, PC A02/MF A01. Order Number DE83016880.

The essential part of this report was the development of computer models of the underground coal gasification (UCG) process. A simplified analysis of coal pyrolysis and drying history was developed for various coal geometries. The formulation assumes time-dependent, one-dimensional flow for the thermal, mass and momentum characteristics within the coal. Conservation equations for the pyrolyzing coal, the inert coal, and the liquid water content inside the coal were derived and solved by adapting general-purpose computer solution packages, thus obviating the need for expending considerable time and effort in developing new solution schemes. The results show that surface temperature and physical dimensions have sizable effects on the heat transfer, pyrolysis, and drying histories. 8 references, 11 figures.

48525 (UCRL—89009) **Coal pyrolysis and methane decomposition in the presence of a hot char bed.** Peters, P.E.; Kang, S.W.; Thorsness, C.B. (Lawrence Livermore National Lab., CA (USA)). Aug 1983. Contract W-7405-ENG-48. 18p. (CONF-830827—7). NTIS, PC A02/MF A01. Order Number DE83016563.

From 9. annual symposium on underground coal gasification; Bloomingdale, IL, USA (7 Aug 1983).

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The products of coal pyrolysis can have a significant impact on the ultimate products produced from underground coal gasification (UCG) systems, especially the hydrocarbons. As a result, some type of pyrolysis submodel is necessary to successfully model a UCG system. The underground system produces pyrolysis products characteristic of all temperature regimes simultaneously and continuously. In addition, these products undoubtedly are in contact with hot gas, char, and/or ash for a much longer time than is typical in powder pyrolysis experiments. In these experiments coal is continuously fed onto a hot bed of char. The pyrolysis products are swept down through the hot char before being removed from the reactor. In this paper we describe the results of these experiments, which have to date been performed at temperatures of 500 to 900°C and pressures of 100 to 600 kPa. The data show that methane production reaches a peak near 800°C and that the influence of the modest pressure change from 100 to 600 kPa is small. In conjunction with these lumped experiments we are also looking at the reactions of methane with hot char and gas, partly as a model compound for the pyrolysis process and partly because of methane's importance as a UCG product. We have conducted a variety of experiments using homogeneous reactors and reactors packed with char. The data from these experiments are presented and an engineering rate expression is derived for methane decomposition. The derived expression is consistent with the increased hydrogen production and decreased methane production seen in the continuous feed experiments for temperatures above 800°C. We find the methane decomposition expression predicts that for typical UCG processes, methane cannot exist in the presence of char for more than 1.5 minutes at 900°C or for more than 30 seconds at 1000°C. 16 figures, 5 tables.

48526 (UCRL—89084) **Underground-coal-gasification cavity simulator with solid motion.** Thorsness, C.B.; Cena, R.J. (Lawrence Livermore National Lab., CA (USA)). Jun 1983. Contract W-7405-ENG-48. 38p. (CONF-830827—6). NTIS, PC A03/MF A01. Order Number DE83016530.

From 9. annual symposium on underground coal gasification; Bloomingdale, IL, USA (7 Aug 1983).

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The prediction of cavity growth and product composition have long been major goals in the development of underground coal gasification (UCG). Lawrence Livermore National Laboratory (LLNL) is developing a UCG cavity growth model which incorporates many of the key features observed during our recent large block (LBK) tests conducted at the WIDCo mine at Centralia, Washington, in which early cavity growth and product yield were studied. Postburn excavation following the tests revealed oval-shaped, rubble-filled cavities with significant void space under the cavity roof. The bottom portion of the cavity contained ash and slag, with an overlying rubble region of coal, char, and ash. A void space existed between the rubble pile and the cavity roof which was generally flat with square corners, a result of the apparent breaking away and falling in of the roof material. In this paper, basic features of the model are described and a number of preliminary runs are documented. These runs include matching of the LBK data, studies of sensitivity to variations in model parameters and operational parameters, and calculations of possible performance of the upcoming Centralia partial-seam CRIP test.

48527 Isomerization of tetra-hydroaromatic groups under coal liquefaction conditions. McNeil, R.I.; Cronauer, D.C.; Young, D.C. (Gulf Research & Development Company, PO Drawer 2038, Pittsburgh, PA 15230). *Fuel;* 62: No. 4, 401-406(Apr 1983). Contract AC22-80PC30080.

Model compound and coal liquefaction experiments have been carried out in a study of the isomerization of tetra-hydroaromatic groups in the solvent, a reaction which greatly reduces its hydrogen donor capability and limits the degree of upgrading of the coal-derived liquids. Major conclusions are: (1) solvent isomerization of hydroaromatics cannot be prevented in that the reaction is due to the presence of free radicals, which cannot be avoided in coal liquefaction; (2) the extent of the reaction at 450°C indicates that the coal radicals have about the same selectivity in hydrogen abstraction as do benzyl radicals; (3) mineral matter in coal does not appear to compound the problem by promoting the isomerization reaction; and (4) the isomerized products are very stable under coal liquefaction conditions and, therefore, the build-up of methylindan-type structures is expected to be a problem in coal liquefaction processes.

0105 By-products

48528 (BMFT-FB-T—83-072) Chemically and physically modified coal tar pitches and their application. Zellerhoff, R. (Bundesministerium fuer Forschung und Technologie, Bonn (Germany, F.R.)). May 1983. 106p. (In German). NTIS (US Sales Only), PC A06/MF A01. Order Number DE83751097.

Preparation of chemically/physically modified coal tar pitches according to following procedures: 1. Thermolysis of coal tar fractions (pitches, aromatic oils) in presence of plastics (polystyrene resp., polystyrene waste), cracked at temperatures between 300°C and 400°C into oligomers and monomers (benzene homologues) which induce radical polycondensation reactions of aromatic tar oils. Depending on the tar feedstock we got binder materials for carbon electrodes (electrode-binder) and precursors for isotropic carbon (nuclear graphite). 2. Conversion of coal tar fractions with dehydrogenating agents such as sulfur, sulfur compounds and atmospheric oxygen into potential binder material for road construction. 3. Separation of pitch fractions according to their thermal reactivity by charge transfer complexation (picric acid) for "flash carbonization".

0106 Properties

REFER ALSO TO CITATION(S) 48518, 48528, 48577, 48596

48529 (DOE/PC/30223—9) Petrographic characterization of Kentucky coals: relationship between sporinite spectral fluorescence and coal rank of selected western Kentucky coals. Final report, Part I. Poe, S.H.; Hower, J.C. (Eastern Kentucky Univ., Richmond (USA). Dept. of Geology; Kentucky Univ., Lexington (USA)). 1983. Contract FG22-80PC30223. 74p. NTIS, PC A04/MF A01. Order Number DE83016511.

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A total of 43 coal samples were analyzed - the majority from western Kentucky, with a few from Pennsylvania for comparative purposes - using quantitative fluorescence microscopy of sporinite to determine if coal rank as determined by vitrinite maximum reflectance could be predicted by data gathered from selected fluorescence parameters. All eight parameters (wavelength of highest intensity, area under curve to the left of the peak, area in the blue wavelengths (400 to 500 nm), green (500 to 570 nm), yellow (570 to 630 nm), blue-red ratio, and red-green ratio were found to statistically predict coal rank. The general research hypothesis, which included all the variables, had a $R^2 = 0.354$. The results of the stepwise regression yielded red and yellow (collective $R^2 = 0.341$) as the best predictor variables of coal rank. The individual parameters of area of red wavelength and blue-red ratio accounted for the greatest variance in predicting coal rank, while the parameter yellow area was the least predictive of coal rank. 31 references, 7 figures, 5 tables.

48530 (DOE/PC/50809—T2) Determination of the surface reactivity of coal powders. Third quarterly report, March 1, 1983-May 31, 1983. Fowkes, F.M.; Jones, K.L. (Lehigh Univ., Bethlehem, PA (USA). Dept. of Chemistry). 27 Jul 1983. Contract FG22-82PC50809. 9p. NTIS, PC A02/MF A01. Order Number DE83015896.

The electrophoresis of coal powders in organic media was initiated in the previous quarter as a quick method of determining surface acidity of basicity. Initially Freon 113 was used as an inert liquid medium and pyridine was added up to 1% to act as an electron-donor to coal particles. In this period we have explored electrophoresis directly in acidic (electron-accepting) and in basic (electron-donating) liquids of our four coal samples (high and low ash anthracites and bituminous coals). The results obtained in acidic (electron-acceptor) liquids (methylene chloride, chloroform, and 1,2-dichloroethane), in basic (electron-donor) liquids (acetone, methyl isobutyl ketone, and pyridine) and lower alcohols are shown in tubular forms. Electron-donor liquids provide negative potentials to electron-accepting (acidic) surface sites and electron-accepting liquids provide positive potentials to electron-donor (basic) surface sites. The two anthracite coals (PSOC 870 and 868) appear to have more surface acidity and basicity than the bituminous coals (PSOC 11 and 213), and the high basicity of the high-ash anthracite is most noteworthy. The coal suspensions with high zeta-potential do not settle out appreciably and they were found to be very rapidly electro-deposited. 5 figures. 2 tables.

48531 (IS—4816) Fossil-energy quarterly report, October 1-December 31, 1982. (Ames Lab., IA (USA)). Jan 1983. Contract W-7405-ENG-82. 44p. NTIS, PC A03/MF A01. Order Number DE83016405.

Progress in the Ames Laboratory coal-related research programs is described: (1) on-line measurement of pyrite and minerals in coal; (2) supercleaning various US coals, mixing them in various proportions, fuzing by controlled heating, and determining the phases present, bulk chemical content, and fusion behavior; (3) development of a coal preparation test facility; (4) regeneration of alkali compounds used in the Gravimelt process (several possible chemical reactions and thermochemical data associated with them are considered); (5) instrumental studies on cleaned coal, mineral wastes and mineral matter (composition, phases, trace and mineral elements, size distribution, scanning electron microscopy, changes on cleaning, etc. (LTN)

48532 (IS—4835) Fossil-energy quarterly report, January 1-March 31, 1983. (Ames Lab., IA (USA)). Apr 1983. Contract W-7405-ENG-82. 62p. NTIS, PC A04/MF A01. Order Number DE83016755.

This report covers progress in on-line measurement systems, based on short wave length molybdenum x-ray radiation, to measure and monitor pyrite and minerals in coal. The work includes super-cleaning and blending of several American coals and determining the phases in the low temperature ash and phase transformations in these ashes by further heat treatments. Iowa State's coal preparation facility is being modified for future work. Efforts to characterize the mineral matter, trace element, and organic sulfur distribution in raw and processed coal are reported. X-ray diffraction and scanning electron microscopy were used along with chemical methods. This work should be of use in deciding the optimum fineness of grinding certain coals for cleaning. Considerable work on the chemistry of the Gravimelt process for coal desulfurization is reported, particularly with respect to regeneration of the alkali compounds used in the process. (LTN)

48533 (KHM-TR—41) Coal analyses. Blomqvist, G. (Statens Vattenfallsverk, Vaellingby (Sweden). Projekt KOL-HAELSA-MILJOE). Feb 1983. 76p. (In Swedish). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83750988.

The report is mainly a compilation of analytical data for coals from those coal districts which have been considered of most interest by Swedish coal experts for future Swedish import. These districts were listed in Spring 1980, when the selection was done they are: Australia, Western Canada, USA, Colombia, South Africa, European coal-producing coutries: Poland, USSR, Great

Britain. Our primary intention has been to show the parameters related to environmental impact, but parameters connected to operation and economy have been included, too. The report includes 23 type analyses, 10 of which are supplemented with analyses of our own. When possible the type analyses were obtained through the coal suppliers, otherwise by compilation of literature data. Literature data has been used particularly for US coals, where rather comprehensive data are available particularly for trace elements. Information on trace element concentrations from other countries are often very scanty. For each region background information and comments are given in addition to the analysis. It might be generally concluded that the analyses performed at Studsvik show a reasonable agreement with the mean concentrations reported. This means that deviations are normally within about 20% for all properties but trace element concentrations. For these a factor 2-3 is normal. It is observed that Australia, Western Canada, and Western US have coals low in sulfur, pyritic sulfur and trace elements normally presented as sulfides including Hg, As, Cd, Zn, Pb. The sulfur and trace element concentrations in other regions are normally higher.

48534 **(PB—83-211912) Effect of atmospheric oxygen on the structure of coals. Annual report Feb 82-Jan 83.** Larsen, J.W.; Schmidt, T.E. (Tennessee Univ., Knoxville (USA)). Feb 1983. 28p. NTIS, PC A03/MF A01.

Samples of a bituminous coal were exposed to air under controlled conditions of temperature and humidity. The coal was subjected to tests measuring the volumetric swelling by pyridine, the pyridine extraction yield, the free carboxylic acid content and the free swelling index. The values obtained by the first of these tests were nearly constant over the time when the other tests indicated substantial changes in the coal's properties due to oxidation at 80°C. The effect of air on the coal's plastic properties is suggested to be more closely related to changes in the surface of the coal than to the overall macromolecular structure.

48535 **(PB—83-211938) Petrographic and fluorescence spectral properties of liptinite and vitrinite coal macerals. Annual report Jan-Dec 82.** Crelling, J.C. (Southern Illinois Univ., Carbondale (USA)). 26 Jan 1983. 58p. NTIS, PC A04/MF A01.

The purpose of this study is to gain a better understanding of the properties of the various liptinite and vitrinite macerals. Because it is both expensive and very difficult to separate the various macerals from coal, the macerals will be studied in situ by quantitative fluorescence microscopy. This method has only recently been applied to the study of coal and has already lead to the discovery of new macerals, and a better understanding of coal rank and the coalification process. During this year the fluorescence microscopy system in the Coal Characterization Laboratory at SIUC has been greatly improved with the addition of a Ploem illuminator and a matching objective lens of high numerical aperture. The ability of the fluorescence microscopy system to process spectral data from coal macerals has also been improved by the interfacing of an Apple II computer dedicated to the task. In addition, the petrographic and chemical characterization of 13 samples of Herrin (No. 6) and 12 samples of Harrisburg-Springfield (No. 5) coal seams, has been nearly completed and 218 spectra on various macerals have been determined.

48536 **(PB—83-211946) Application of unconventional solvents and ^{252}Cf-plasma desorption spectrometry in studies of coal. Annual report Feb 82-Jan 83.** Zoeller, J.H. Jr. (Texas A and M Univ., College Station (USA). Dept. of Chemistry). Mar 1983. 47p. NTIS, PC A03/MF A01.

The technique of Californium-252 Plasma Desorption Mass Spectrometry (CFPDMS) was used to screen coals and their DMSO extracts. A number of positive and negative ions originating from the sample have been detected in the molecular weight range 200-2000, although impurity ions are widespread throughout the spectra. Among the coal derived ions are (1) homologous series with mass periodicities of 12, 14, 44 and 75, (2) ions corresponding to RCOOHH (+1), RCOOHNa (1+), RCOO (-1), (3) specific ions seen in samples of different coals. Spectroscopic analysis of Wilcox Lignite and its DMSO extracts has yielded a functional group profile of the coal, including the distribution of types of carbon atoms, hydrogen atoms, oxygen functionalities, bound cations and exchangeable protons. Interpretation of the CFPDMS spectra in terms of this profile is in its preliminary stage.

48537 **Reactions of coal in acidic phenol. Model compound studies.** Larsen, J.W.; Lee, D. (Department of Chemistry, University of Tennessee, Knoxville, Tennessee 37916). *Fuel;* 62: No. 4, 463-465(Apr 1983).

The cleavage of a series of methylene- and ether-linked aromatics has been studied in phenol acidified with p-toluenesulfonic acid as model processes for the acidic 'depolymerization' of coals. Methylene-linked unactivated aromatics do not react during refluxing for 24 h, whereas cleavage sometimes occurs if the aromatic moiety has electron-donating substituents. Benzylic ethers are cleaved, but also undergo a variety of condensation reactions. The failure of the acid-catalyzed depolymerization of coals in phenol may be due either to the lack of cleavable bonds in the coal or to internal condensation reactions which compete with the depolymerization.

0108 Waste Management

REFER ALSO TO CITATION(S) 48557, 48774

48538 **(IS—4823) Direct utilization: recovery of minerals from coal fly ash. Fossil Energy Program. Technical progress report, 1 July 1982-30 September 1982.** Burnet, G.; Murtha, M.J. (Ames Lab., IA (USA)). Jan 1983. Contract W-7405-ENG-82. 104p. NTIS, PC A06/MF A01. Order Number DE83016796.

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Research during the past year has dealt primarily with the fundamentals of the HiChlor process, development of the sintering process, utilization of the fly ash iron-rich fraction, and application of the work to date to the full range of coal conversion solid wastes. Work on the chlorination of coal fly ash to extract metal constituents (HiChlor process) included both chlorination reaction studies and efforts to recover and purify the chloride products. The reaction research comprised an evaluation of several reduction and chlorination agents, the development of techniques for the collection of reaction kinetic data in a form not limited by mass transfer of the reactants, and the use of a fused salt reactor for fly ash chlorination. Chlorination in a fused salt reactor shows promise of providing improved selectivity in the reaction of the metal oxides present and of significantly increasing the reaction rate. A ternary amine organic solvent has been used to extract the Fe ions from an aqueous HCl solution of mixed metal chlorides, followed by precipitation of the Al as $AlCl_3.6H_3O$ and extraction of the titanium ions using tributyl phosphate. Sinter research on coal fly ash, cement kiln dust, and coal refuse sinter mixtures has shown that soluble aluminates can be extracted from ground clinker formed by sintering at 1200°C. Work has also been conducted on the magnetic separation of an iron-rich fraction from coal fly ash in a water slurry, and on the use of the iron-rich fraction as heavy medium material in coal beneficiation.

48539 **(IS—4837) Direct utilization - recovery of minerals from coal fly ash. Advanced research and technology. Technical progress report, 1 January 1983-31 March 1983.** Burnet, G.; Murtha, M.J. (Ames Lab., IA (USA)). May 1983. Contract W-7405-ENG-82. 50p. NTIS, PC A03/MF A01. Order Number DE83016794.

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The primary objective is to develop and/or improve methods for utilization of coal fly ash as a source of minerals. Processes are being studied for the recovery of aluminium, iron, and titanium from fly ash and for the utilization of residues. There are 4 tasks which include: development of the HiChlor process; improvement of the Lime-Soda Sinter Process; improvement of the Lime-Flyash Sinter Process; and the recovery and use of an iron-rich fly ash fraction. Progress accomplished during the quarter ending March 31, 1983, is reported. 6 references, 21 figures, 9 tables. (DMC)

48540 (LBL—15295, pp 1.38-1.42) **Processing of condensate waters from coal gasification.** King, C.J.; MacGlashan, J.; Mohr, D.; Mackenzie, P.; Thompson, R.; Bixby, J. Jun 1983. NTIS, PC A04/MF A01. Contract AC03-76SF00098.

In Energy & Environment Division annual report. Chemical process research and development program, FY 1982.

The principal objective of this project is to develop workable, reliable, and economical physicochemical processing methods that will enable coal gasification condensate waters to be recycled. Particular attention is being given to solvent-extraction and energy-efficient stripping processes, and to combinations of these. Work to date has focused upon four areas: (1) analyses of individual components contributing to the measured Chemical Oxygen Demand (COD); (2) extraction with both conventional and novel solvents to allow more complete reduction of COD and/or lower energy consumption; (3) interpretation of rates of stripping of ammonia and acid gases from condensate waters; and (4) innovative combinations of extraction and stripping that have the potential to reduce substantially the energy required to remove ammonia and isolate it as a salable product. Highlights of accomplishments during 1982 and planned activities during 1983 are summarized.

48541 **(PB—83-196584) Remote monitoring of a coal waste impoundment in West Virginia. Open file report Oct 78-Sep 81.** Green, G.E.; Roberts, D.A. (Shannon and Wilson, Inc., Seattle, WA (USA); Bureau of Mines, Washington, DC (USA)). Feb 1982. 175p. NTIS, PC A08/MF A01.

This report addresses remote monitoring of coal waste impoundments for stability. Existing automated geotechnical monitoring systems are described and reviewed along with details of instruments suitable for such systems. An impoundment in West Virginia, which was in the construction stage, was instrumented and monitored between July 1979 and May 1981. Sensors that measure surface and subsurface parameters including settlement, horizontal deflection, surface tilt, pore water pressure, seepage, pond level, and meteorlogical parameters were installed. Recommendations for improving and expanding the capabilities of the monitoring system are given.

0109 Environmental Aspects

REFER ALSO TO CITATION(S) 48520, 48564, 49570, 49867, 49872

48542 **(CONF-820793—1) Pisolithus tinctorius ectomycorrhizae reduce moisture stress of Virginia pine on a southern Appalachian coal spoil.** Walker, R.F.; West, D.C.; McLaughlin, S.B. (Oak Ridge National Lab., TN (USA)). 1982. Contract W-7405-ENG-48. 10p. NTIS, PC A02/MF A01. Order Number DE83015532.

From 7. North American Forest Biology workshop; Lexington, KY, USA (25 Jul 1982).

The effect of Pisolithus tinctorius ectomycorrhizae on the moisture status of Virginia pine outplanted on sites disturbed during surface mining operations was studied. Nursery grown seedlings with three levels of infection by this fungal symbiont and control seedlings without Pisolithus were outplanted in April 1979 on a coal spoil in Tennessee. The control seedlings were infected with ectomycorrhizal species endemic to the nursery, primarily Thelephora terrestris, and the seedlings with Pisolithus also had minor infections with this symbiont. A split plot design was utilized such that each of the four ectomycorrhizal treatments contained seedlings fertilized at the rate of 336 kg/ha NPK and nonfertilized seedlings. The internal water status of these seedlings was determined in July 1980, a period of high moisture stress, by the pressure chamber technique. Seedling xylem pressure potential was measured at dawn, when internal water stress was least, and again at midlight, when it was greatest. The internal water stress of the control seedlings was greater than that of all but one of the treatments with Pisolithus ectomycorrhizae, and only the treatment with the lowest level of infection with Pisolithus failed to exhibit significantly less stress than the control seedlings. Differences among treatments in seedling size, percent ground cover, and spoil water potential were not sufficient to produce corresponding differences in internal water stress, and the effect of fertilization was not significant.

48543 **(PB—83-193649) Impact of coal refuse disposal on groundwater. Final report 1975-79.** Libicki, J. (Central Research and Design Inst. for Open-Pit Mining, Wroclaw (Poland); Environmental Protection Agency, Cincinnati, OH (USA). Municipal Environmental Research Lab.). Apr 1983. 190p. NTIS, PC A09/MF A01.

The objective of this study was to determine the extent of groundwater quality deterioration when coal mine refuse and power plant ashes were disposed of in open pits. In addition, disposal methods were developed and procedures for planning and designing disposal sites were formulated. The study was conducted from 1975 to 1979 at an abandoned sand pit near Boguszowice, Poland, where the groundwater was monitored. Laboratory testing of the wastes and its leachates were also conducted. From this work, the physical-chemical character of the waste material and its susceptibility to leaching of particular ions in the water environment were determined, as was the influence of precipitation on the migration of pollutants to the aquifer.

48544 **(PB—83-200600) Prototype computer-interactive goundwater monitoring methodology: an example for sedimentation ponds. Proj. report 1979-81.** Everett, L.G.; Rasmussen, W.O.; Tempo, K. (Kaman Tempo, Santa Barbara, CA (USA)). Apr 1983. 187p. NTIS, PC A09/MF A01.

This report describes a prototype computer-interactive system that assists the development of a groundwater monitoring program for sedimentation ponds at coal strip mines. Even though the monitoring of sedimentation ponds is used as an example, the system consists of a set of instructions applicable to monitoring any specific groundwater pollution source. The instructions enable the user to select from a large amount of text information those portions appropriate to be written into his own file.

48545 **(PB—83-214478) Pollution Control Technical Manual for Lurgi-based indirect coal liquefaction and SNG (substitute natural gas). Final report Jun 82-Feb 83.** (TRW, Inc., Redondo Beach, CA (USA); Radian Corp., Austin, TX (USA); Environmental Protection Agency, Research Triangle Park, NC (USA). Industrial Environmental Research Lab.). Apr 1983. 651p. NTIS, PC A99/MF A01.

The Environmental Protection Agency (EPA), Office of Research and Development has undertaken an extensive study to determine synthetic fuel plant waste stream characteristics and to evaluate potentially applicable pollution control systems. The purpose of this and all other PCTMs is to convey this information in a manner that is readily useful to designers, permit writers, and the public. This specific PCTM addresses coal-based synthetic fuels facilities using dry ash Lurgi gasifiers to generate a synthesis process feed gas. Product synthesis technologies examined in this PCTM include: methanation to produce substitute natural gas (SNG), methanol synthesis, Mobil M-gasoline synthesis from methanol, and Fischer-Tropsch synthesis.

48546 **(PB—83-214486) Pollution Control Technical Manual for Exxon Donor Solvent direct coal liquefaction. Final report Apr 82-Oct 82.** (TRW, Inc., Redondo Beach, CA (USA); Environmental Protection Agency, Research Triangle Park, NC (USA). Industrial Environmental Research Lab.). Apr 1983. 588p. NTIS, PC A25/MF A01.

The Environmental Protection Agency (EPA), Office of Research and Development, has undertaken an extensive study to determine synthetic fuel plant waste stream characteristics and pollution control systems. The purpose of this and all other Pollution Control Technical Manuals (PCTMs) is to convey this information in a manner that is readily useful to designers, permit writers, and the public. The Exxon Donor Solvent (EDS) direct coal liquefaction PCTM addresses the coal liquefaction technology being developed by Exxon Research and Engineering Company. Two configurations of the EDS process are considered in detail in this manual. These are the base case configuration and the Market Flexibility Sensitivity (MFS) configuration. This manual describes the two configurations of the EDS process, characterizes the waste streams produced in each medium, and discusses the array of commercially available controls which can be applied to the base plant waste streams.

48547 **(PB—83-214502) Pollution Control Technical Manual for Koppers-Totzek based indirect coal liquefaction. Final report Jun 82-Feb 83.** (TRW, Inc., Redondo Beach, CA (USA); Environmental Protection Agency, Research Triangle Park, NC (USA). Industrial Environmental Research Lab.). Apr 1983. 498p. NTIS, PC A21/MF A01.

The document is one of six technical handbooks prepared by EPA to help government officials granting permits to build synfuels facilities, synfuels process developers, and other interested parties. They provide technical data on waste streams from synfuels facilities and technologies capable of controlling them. Process technologies covered in the manuals include coal gasification, coal liquefaction by direct and indirect processing, and the extraction of oil from shale. The manuals offer no regulatory guidance, allowing the industry flexibility in deciding how best to comply with environmental regulations.

48548 **(PB—83-219923) Post-mining neutralization of acid surface mine lakes.** Brugam, R.B.; Carlson, M.A.; Chakraverty, S.; Lusk, M. (Illinois Univ., Urbana (USA). Water Resources Center; Office of Water Research and Technology, Washington, DC (USA); Southern Illinois Univ., Edwardsville (USA)). Apr 1983. 106p. NTIS, PC A06/MF A01.

Twenty core samples and 54 surface sediment samples were taken from surface mine lakes in Missouri, Illinois, and Indiana to determine the rates of neutralization of acid mine lakes. Sediment samples were analysed for diatom microfossils, selected chemical elements, and the radionuclide, lead-210. Comparisons between lake sediment and water column chemistry indicated that neither sulfide deposition nor H2S outgasing is likely to play a major role in the neutralization process. Chemical analyses of lake sediment showed that the sediment is a sink for heavy metals. These metals are held as sulfides. There is also a considerable fraction of metal ions strongly bound to clays. This research demonstrates that acid lake neutralization is common, that it occurs over moderate time spans and that the rate is controlled by rates of acid supply from the watershed.

0110 Reserves And Exploration

48549 (ESG-DOE—13405, pp 6p, Paper 2) **Peat conversion and utilization in the United States.** Kopstein, M. Jul 1983. NTIS, PC A10/MF A01.

In Advancement of peat hydrogasification. Final report, July 1983.

Peat is a fossil fuel, classified as a geologically young coal, with expansive deposits in the United States. The extent of the peat resource exceeds the known US deposits of oil, conventional natural gas, and lignite-combined. It is an excellent feedstock for conversion to low, medium, and high Btu gas, liquids, a beneficiated solid product, and for direct utilization in the generation of electricity. At this time, peat is used only for non-energy purposes in the United States. Substantive development of a technology to convert peat to substitute natural gas has been underway for only five years. Development of procedures for converting peat to liquid and solid (beneficiated) products, and for its direct burning have been commenced more recently. Important social, technical, environmental, and economic issues must be addressed and resolved prior to the large scale utilization of peat in the US for energy purposes.

48550 **(PB—83-194456) Murphysboro coal, Jackson and Perry counties: resources with low to medium sulfur potential. Illinois mineral notes.** Jacobson, R.J. (Illinois Inst. of Natural Resources, Champaign (USA). State Geological Survey Div.). 1983. 26p. NTIS, PC A03/MF A01.

The Murphysboro Coal Member of the Spoon Formation, which occurs 200 to 400 feet below the widely mined Springfield (No. 5) Coal Member of the Carbondale Formation, ranges in depth from less than 50 feet to over 600 feet. The Murphysboro contains shale partings, most of which are minor. Near the town of Murphysboro, however, one shale parting varies from a few inches thick about 2 miles away from the channel to 35 feet thick less than 1/2 mile from the channel. The thick areas of coal, up to 7 1/2 feet, appear to lie mainly along the margins of the Oraville channel.

0120 Mining

REFER ALSO TO CITATION(S) 48544, 48585, 48587, 49833

48551 **(DOE/CS/50115—T32) Coal-Resources Model: an impact-analysis tool. Final report.** Yabroff, I.W.; Dickson, E.M. (SRI International, Menlo Park, CA (USA)). Jan 1980. Contract AT03-76CS50115. 99p. NTIS, PC A05/MF A01. Order Number DE83016088.

Our latest version of the Coal Resources Model uses a much improved method of estimating coal extraction costs, and draws on improved and more detailed coal resource data. As before, our model assumes that all coal for major conversion installations (electric power, gasification, liquefaction, and industrial heat) is procured by long-term contract. The model simulates the contract negotiation process, by taking into account coal extraction costs, coal quality (heating value and sulfur content), and transportation costs (unit train, slurry pipeline, barge, and rail-barge combinations). The model negotiates hundreds of contracts sequentially and independently just as in the real world. Each negotiation chooses the least cost combination of coal and transportation available. Because the coal committed by each contract is removed from the market, the next buyer must select coal still uncommitted by contract. The model keeps track of both committed coal and coal actually extracted and used. Because it is a simple accounting model, the SRI Coal Resources Model easily processes a demand scenario spanning 50 to 75 years and involving more than a 1000 simulated contract negotiations at a cost of only about $125. Moreover, a user can change assumptions regarding the level or pattern of coal demand, state severance taxes, sulfur scrubbing costs, transportation costs, conversion plant locations, and the like simply and cheaply. Users can thus employ the model in exploring markets, impacts, and impact-mitigation strategies, as well as in analyzing the consequences of a broad range of public policy actions. This report displays and discusses several examples of model outputs based on different input assumptions.

48552 **(DOE/PC/52274—T3) Mining research and development program. Quarterly report, March 25, 1983-June 25, 1983.** Swisher, J.H. (Southern Illinois Univ., Carbondale (USA). Coal Extraction and Utilization Research Center). 1983. Contract FG22-82PC52274. 18p. NTIS, PC A02/MF A01. Order Number DE83016601.

During this quarter, six technical project activities were operating. These were: (a) hydraulic fragmentation (Evers, Eddingfield), (b) analysis of economics and productivity in strip mining (Myers), (c) integration of man and machine into efficient mining (Lindsey), (d) computer models for simulation in coal mining (White), (e) geotechnical studies related to advanced mining (Chugh), and (f) dragline simulator training systems (Contor). Progress in each of these areas is described briefly.

48553 **(MESA-IR—1053) Permissible electric face equipment and other mine equipment approved from January 1969-December 1974.** Lee, F.R. (Mining Enforcement and Safety Administration, Pittsburgh, PA (USA). Approval and Certification Center). 1977. 90p. NTIS, PC A05/MF A01. Order Number DE83902996.

This publication lists permissible mine equipment, except respiratory protective apparatus and explosives, approved by the Bureau of Mines and Mining Enforcement and Safety Administration (MESA) from January 1, 1969, through December 31, 1974, for use in underground coal and gassy noncoal mines. It also lists mobile diesel-powered equipment approved for underground noncoal mines. The Federal Coal Mine Health and Safety Act of 1969, the Federal Metal and Nonmetallic Mine Safety Act and the implementing federal regulations require that only permissible equipment, that is, equipment meeting specifications prescribed by the Secretary of the Interior to assure that such equipment will not cause a mine explosion or fire, may be used in or by the last open crosscut of an underground gassy mine. The purpose of this publication is to inform the public about approved equipment available to comply with these laws and regulations.

48554 **(MESA-IR—1054) Ventilation to control the smoke from a fireproof structure.** Hadden, J.D.; Smith, R.L.; Luzik, S.J.; Seiler, E.C. (Mining Enforcement and Safety Administration, Pittsburgh, PA (USA). Pittsburgh Technical Support Center). 1977. 17p. NTIS, PC A02/MF A01. Order Number DE83902974.

Tests were performed to measure the ventilation parameters, under practical circumstances, required to prevent smoke from a fire within an enclosure (ventilated to the mine return) from reversing through the intake air opening and contaminating the intake air course. The tests were made in a structure simulating an underground fireproof enclosure formed between two masonry stoppings in a crosscut between intake and return air courses. Each stopping contained an opening through which ventilating air flowed from the intake air course to the return air course. Although the initial intent was to determine a single velocity which would control the airflow direction through a ventilated underground enclosure in the event of a fire, preliminary tests showed that the complexity of the airflow system generated by a fire precludes a simple velocity application. Based on the results obtained under test conditions, the smoke from a fire in a ventilated fireproof structure or area located underground adjacent to a return air course and on a separate split of air should travel in the same direction as the normal ventilating current when the following conditions are met: the centerline velocity of the ventilating air current through the intake opening is in excess of approximately 1100 fpm as measured with a 4-inch rotating vane anemometer; the maximum dimensions of the intake opening are 16 inches high and 24 inches wide; the discharge opening dimensions are 16 inches high and 24 inches wide; and the intake and discharge stopping walls are 10 feet or more apart and the enclosed volume is approximately 640 cubic feet or more. The conditions stated are valid for all cases tested; however, in specific cases, lower air velocities may be adequate. The most effective location of openings resulted with the intake at the bottom and the discharge at the top. The air quantity through the structure may be regulated by decreasing the dimensions of the intake opening.

48555 **(MESA-IR—1055) Monitoring and warning instrumentation of pillar movements in salt.** Ellickson, M.L. (Mining Enforcement and Safety Administration, Denver, CO (USA). Denver Technical Support Center). 1977. 13p. NTIS, PC A02/MF A01. Order Number DE83902973.

Personnel from the Ground Support Branch, Denver Technical Support Center, Mining Enforcement and Safety Administration, instrumented and monitored lateral deformation occurring in the pillar ribs at the shaft bottom of an underground salt mine. The object of the instrumentation was to forewarn mining personnel of possible excessive deformation of the pillar ribs with subsequent damage occurring to the timbers at the shaft bottom. This instrumentation and warning system was installed at four locations around the shaft bottom to measure the deformation of the piller ribs over an extended period of time. In general, the measurements indicated a near constant rate of time-dependent convergence with no acceleration or sustained increase in rate of convergence.

48556 **(MSHA/IR—1093) Regional enforcement of mine safety and health regulations and miner education and training in the Federal Republic of Germany.** Schlick, D.P.; Thirumalai, K. (Mine Safety and Health Administration, Arlington, VA (USA)). 1978. 15p. NTIS, PC A02/MF A01. Order Number DE83902775.

A regional system of mine safety and health enforcement works effectively in the Federal Republic of Germany. This report discusses some salient features of the regional mining enforcement system in the Federal Republic of Germany and the interactions between the regional mine enforcement and operator-funded institutions that provide technical support and miner training. Mining enforcement is regionalized into five independent regions. Each region has technical, research, and education and training services to support the enforcement. Technical services to assist operators in complying with the regulations are provided both by the inspectorate and the operator-funded mining research and testing centers located in each region. Mine safety and health and miner training plans are submitted by operators to meet the requirements of the regulations and are reviewed and approved by the regional inspectorate. The plans play a pivotal role in ensuring that the safety and health of mines and the quality of coal miner training meets the standards required by law. German coal miners undergo elaborate training programs to qualify for technical work positions and for upward mobility within the coal mining industry. The general layout and approach of the German miner training system results in miners undergoing extensive training on a broad range of subject areas that have direct and indirect impact on their occupation. The training regulations and training plans identify separate procedures for training new miners, foreign immigrants, inexperienced miners, experienced miners with over 6-months interruption on their regular jobs and young miners. The German training system places special emphasis to train young miners below 18 years of age.

48557 **(MSHA/IR—1109) Design guidelines for coal-refuse piles and water, sediment, or slurry impoundments and impounding structures.** (Mine Safety and Health Administration, Denver, CO (USA). Health and Safety Analysis Center). 1979. 31p. NTIS, PC A03/MF A01. Order Number DE83902806.

Portions are illegible in microfiche products.

This publication presents guidelines used by the Mine Waste Branches of the Mine Safety and Health Administration's Denver Technical Support and Pittsburgh Technical Support Centers and by MSHA district managers in their review of engineering plans for coal refuse impoundments. These guidelines give detailed information on the hydrologic, hydraulic, and geotechnical factors that should be considered in planning such structures. A plan review checklist is included. The current Mine Safety and Health Administration amended regulations on refuse piles and impounding structures became effective on November 1, 1975. These regulations are set forth in Title 30, Code of Federal Regulations, Sections 77.214 to 77.217. The regulations on refuse piles include requirements for reporting pertinent information, identification, construction, and certifying stability. The regulations on impounding structures include requirements for development and approval of construction plans, notification of potentially hazardous conditions, and identification. The MSHA district managers have the responsibility to approve the engineering plans for proposed construction or modification of waste disposal facilities before the plans are carried out. On request, the Mine Waste Branches provide the district managers with technical reviews of and recommendations of these plans. To minimize any differences in the philosophy used by each branch in their review of plans, the design guidelines presented in this publication were jointly developed. These guidelines should be followed in the preparation of required submittals. This will speed the review process by eliminating the need for MSHA to request additional work and resubmittal. Supporting data and engineering calculations for stability, hydrology, hydraulics, and laboratory data should be submitted along with the engineering plan and specifications.

48558 **(MSHA/IR—1110) Frictional ignition of methane by continuous-mining machines in underground coal mines.** Kawenski, E.M.; Price, G.C.; Stephan, C.R. (Mine Safety and Health Administration, Pittsburgh, PA (USA). Pittsburgh Technical Support Center). 1979. 14p. NTIS, PC A02/MF A01. Order Number DE83902805.

This report presents information on frictional methane ignitions associated with continuous miners. Data indicate a gradual increase in frictional methane ignitions over the 6-year period 1971 through 1976. Ninety percent of these ignitions are attributed to continuous-mining machines. Factors affecting such frictional ignitions are analyzed and recommendations are submitted for reducing their incidence: make proper use of diffuser fans, line curtains, check curtains, and ventilation tubing or combinations thereof; minimize obstructions to air flow such as coal piles and secondary loading behind continuous miners; minimize air leakage by proper construction and maintenance of ventilation controls; and utilize Venturi principle of water sprays to increase flow of air between face and continuous miner cutter head. The following additional safety measures may aid in preventing and/or quenching frictional ignitions: reduce speed of rotation of cutting heads; insure adequacy of water flow through spray heads to facilitate cooling of cutter bits; exercise caution with respect to possible methane liberations while mining through clay veins and taking roof or bottom rock; replace dull and broken cutter bits promptly; insure proper functioning, maintenance, and calibration of methane monitors; locate

methane monitors as near as practicable to the front of the continuous mining machine; and fromote and encourage developments in technology leading to a system to detect and suppress methane ignitions caused by face-cutting equipment.

48559 **(PB—83-191593) Frictional ignition suppression by the use of cutter-drum mounted sprays. Open file report Apr 79-Dec 81.** Agbede, R.O.; Whitehead, K.L.; Mundell, R.L.; Saltsman, R.D. (Bituminous Coal Research, Inc., Monroeville, PA (USA); Bureau of Mines, Washington, DC (USA)). Jan 1982. 135p. NTIS, PC A07/MF A01.

The contract objective was to conduct tests with a full-scale longwall shearer drum in a simulated mine environment to determine the effectiveness of drum-mounted water sprays in controlling frictional ignitions. The tests were conducted with a drum equipped with a single bit that cuts a sandstone block enclosed in a chamber filled with a combustible methane-air mixture. Without the sprays operating no ignition occurred when only the carbide tip was impacting the stone. The likelihood of ignition increased with degree of bit wear and exposed steel contact area. Backflushing sprays, properly applied, were effective in controlling ignitions, but pick flushing and bit-cooling sprays were ineffective. Decreasing drum speed did not reduce the likelihood of ignitions until a bit peripheral speed of 200 fpm, 14 rpm for a 54-inch drum, was reached. A fully laced drum was then designed and tested. Results corroborated the findings of the single-bit tests.

48560 **(PB—83-197095) Guide to geologic features in coal mines in the northern Appalachian coal basin. Information circular/1983.** Jeran; Paul, W.; Jansky, J.H. (Bureau of Mines, Pittsburgh, PA (USA). Pittsburgh Research Center). Mar 1983. 23p. (BM-IC—8918). NTIS, PC A02/MF A01.

This Bureau of Mines report has been prepared to provide a means whereby mineworkers without specific geologic training can recognize and record the existence of potentially hazardous geologic features encountered in coal mines. Each geologic feature described in this report has been implicated in roof failure. Through the recording of the observations of mineworkers, based on this report, a geologic map of mine workings and the associated ground control problems can be compiled. From such maps, the trends of changes and features can be determined and projected ahead of mining. The face crew can be alerted to a potential problem and what to look for as the face is advanced.

48561 **(PB—83-197103) Lake Lynn Laboratory: construction, physical description, and capability. Information circular/1983.** Mattes, R.H.; Bacho, A.; Wade, L.V. (Bureau of Mines, Pittsburgh, PA (USA). Pittsburgh Research Center). Mar 1983. 47p. (BM-IC—8911). NTIS, PC A03/MF A01.

The Lake Lynn Laboratory is a multipurpose mining research laboratory operated by the Bureau of Mines and located in Fairchance, Pa. It consists of both surface and underground facilities. The initial focus of the facility, scheduled for full operation in fall 1982, will be on the problems of fires and explosions in mines. The initial experimental explosion was fired on March 3, 1982. The intent of this document is to provide the reader with detailed information on the physical capabilities of the Lake Lynn Laboratory. Subsequent publications will focus on the capabilities of Lake Lynn as compared with those of other similar facilities worldwide, and a comparison of initial explosion test results realized at Lake Lynn and comparable results from the Bruceton Experimental Mines.

48562 **(PB—83-197582) Coal cutting mechanics and noise generation. Report of investigation/1983.** Bartholomae, R.C.; Becker, R.S. (Bureau of Mines, Pittsburgh, PA (USA). Pittsburgh Research Center). Mar 1983. 34p. (BM-RI—8743). NTIS, PC A03/MF A01.

The report presents the results of a laboratory investigation of coal cutting mechanics and noise. These experiments were performed using a linear cutting apparatus that operates over a broad cutting speed range. The influence of several coal cutting parameters on the noise, force, productivity, and specific energy associated with linear cuts was ascertained. Some basic theoretical aspects of coal cutting mechanics and noise generation are discussed, and the results of the laboratory experiments are used to formulate analytical models of the coal cutting forces and noise. The analytical model for coal cutting noise is then generalized to account for the more important effects of rotary cutting. Based on the generalized model, an estimate of the sound pressure level at an operator's position is made for a typical continuous mining machine.

48563 **(PB—83-197624) Design procedures for coal mine tunnels. Open file report 1 Oct 79-31 Dec 82 (final).** Bieniawski, Z.T. (Pennsylvania State Univ., University Park (USA); Bureau of Mines, Washington, DC (USA)). 31 Mar 1983. 49p. NTIS, PC A03/MF A01.

Although coal mine tunnels such as the main haulageways or roadways are the lifelines of coal mines, little attention has been paid to them in the United States in terms of preconstruction planning and design. This report summarizes the results of a 3-year research project aimed at improving the design procedures for coal mine tunnels. A new design approach was developed for this purpose and roof-support design charts were prepared for mine tunnels and their intersections. Analytical studies, 'base friction' model experiments, and in situ rock stress measurements were performed during this research.

48564 **(PB—83-200196) Final report of a class iii cultal resources inventory of potential coal production areas in North Park, Jackson County, Colorado. Report for Sep 77-Aug 78.** Lischka, J.J.; Miller, M.E.; Reynolds, R.B.; Dahms, D.; Joyner-McGuire, K. (Colorado Univ., Boulder (USA). Dept. of Anthropology). 1980. 348p. NTIS, PC A15/MF A01.

At the request of the Bureau of Land Management (BLM) and under a contract administered by the Department of the Interior, the Department of Anthropology at the University of Colorado conducted an archeological survey during the 1977 and 1978 field seasons on 25,100 acres of land administered by BLM in North Park, Jackson County, Colorado. The purpose of the survey was to provide a data base that could be used to assess the impact of possible coal mining operations on the cultural resource of the area inventoried. A total of 151 prehistoric sites, 14 historic sites, and 322 isolated finds were recorded during the survey. The artifactual remains recovered from these sites and environmental characteristics of the sites and their catchment areas were used to further define the prehistoric chronology of North Park, construct a typology of prehistoric settlements, and analyze prehistoric subsistence-settlement systems in the Park.

48565 **(PB—83-205385) Development of improved scrubbers for coal mine applications. Contract research report sep 79-mar 82.** Grigal, D.; Ufken, G.; Sandstedt, J.; Blom, M.; Johnson, D. (Donaldson Co., Inc., Minneapolis, MN (USA)). Jul 1982. 124p. NTIS, PC A06/MF A01.

The objectives of this four-task program was to develop smaller, less expensive scrubbers while maintaining or improving scrubber efficiency and reliability. The development included building a scrubber test facility suitable for testing contract-developed and future scrubber systems, develop and test four fibrous-bed panels and two water droplet eliminators to reduce scrubber size and clogging, fabricate and test two fibrous-bed panels for use with the Bureau of Mines rotating, flooded-bed scrubber system, and develop and test water-powered scrubber and recycle water systems for use at low water pressures.

48566 **(PB—83-214866) Preliminary evaluation of bit impact ignitions of methane using a drum-type cutting head. Report of Investigations/1983.** Larson, D.A.; Dellorfano, V.W.; Wingquist, C.F.; Roepke, W.W. (Bureau of Mines, Twin Cities, MN (USA). Twin Cities Research Center). Apr 1983. 30p. (BM-RI—8755). NTIS, PC A03/MF A01.

Preliminary laboratory experiments have been conducted by the Bureau of Mines to define the influence of bit geometry on methane ignitions as a step toward establishing safer mining-machine operating parameters. The experimental system was designed to simulate the operation of a continuous mining machine, using a drum-type cutterhead of normal diameter with a narrow cross section, permitting full-diameter drum cutting tests to be run on material representative of sandstone lenses (or inclusions) in coal seams.

Two conical bit types were tested at shallow depths of cut with three drum speeds.

48567 **(PB—83-214890) Measuring noise from a continuous mining machine. Information Circular/1983.** Bartholomae, R.; Kovac, J.; Robertson, J. (Bureau of Mines, Pittsburgh, PA (USA). Pittsburgh Research Center). Apr 1983. 23p. (BM-IC—8922). NTIS, PC A02/MF A01.

Noise generated by continuous mining machines in underground coal production is an important health hazard. Bureau of Mines Contract J0387229 covers investigation of this noise through laboratory tests of simulated cutting operations and through in-mine noise measurements. The results of these investigations indicate that coal cutting noise and conveyor noise are dominant sources of mining machine operational noise. Typical noise levels for both cutting and conveying operations are approximately 97 dBA (decibels A-weighted).

48568 **(PB—83-216515) Effects of increasing costs on the future relation between open pit and underground mining. Volume 1. Open file report (final) 1 Sep 80-20 Dec 81.** Nilsson, D.S. (Michigan Technological Univ., Houghton (USA); Bureau of Mines, Washington, DC (USA)). Dec 1982. 253p. NTIS, PC A12/MF A01.

The objective of this study was to evaluate the energy consumption in some open pit and underground mines and to show the optimal proportion between open pit and underground mining for different types of commodities. The results of the study show the future relation between open pit and underground mining of different types of deposits, the future competitiveness between large-scale mining of low-grade ore and small-scale mining of high-grade ore, actual power consumption figures for different mining activities, and guidelines for a more energy efficient mining industry. The study provides a base for forecasting mine production of different commodities and for decisions about how to spend research money and organize education in the field of mining engineering.

48569 **(PB—83-216523) Effects of increasing costs on the future relation between open pit and underground mining. Volume 2. Open file report (final) 1 Sep 80-20 Dec 81.** Nilsson, D.S. (Michigan Technological Univ., Houghton (USA); Bureau of Mines, Washington, DC (USA)). Dec 1982. 216p. NTIS, PC A10/MF A01.

The objective of this study was to evaluate the energy consumption in some open pit and underground mines and to show the optimal proportion between open pit and underground mining for different types of commodities.

48570 **(PB—83-218156) Development of an improved man transit vehicle. Volume 1. Prototype demonstration vehicle. Open file report Aug 75-Jun 80.** Pinkston, B.; Hahn, W.F. (Booz, Allen and Hamilton, Inc., Cleveland, OH (USA); Bureau of Mines, Washington, DC (USA)). Jan 1981. 81p. NTIS, PC A05/MF A01.

This report presents a description of a prototype demonstration vehicle that was constructed to assess the feasibility of a set of equipment-related guidelines. State-of-the-art improvements were embodied in such areas as collision survivability, occupant comfort, and multiple mode operation. The electric battery-powered vehicle carries a 12-person section crew at speeds up to 12 mph. The description of the demonstration vehicle is presented in volume 1.

48571 **(PB—83-218164) Development of an improved man transit vehicle. Volume 2. Safety guidelines. Open file report Aug 75-Jun 80.** Pinkston, B.; Hah, W.F. (Booz, Allen and Hamilton, Inc., Cleveland, OH (USA); Bureau of Mines, Washington, DC (USA)). Jan 1981. 124p. NTIS, PC A06/MF A01.

This report presents a description of a prototype demonstration vehicle that was constructed to assess the feasibility of a set of equipment-related guidelines. State-of-the-art improvements are embodied in such areas as collision survivability, occupant comfort, and multiple mode operation. The electric battery-powered vehicle carries a 12-person section crew at speeds up to 12 mph. Safety guidelines are presented in volume 2.

48572 **(PB—83-218594) Personal equipment for low seam coal miners. 8. Improved traction rubber boot soles. Report for 1978-82.** Sanders, M.S.; Downing, J.V. (Canyon Research Group, Inc., Westlake Village, CA (USA); Bureau of Mines, Washington, DC (USA)). Oct 1982. 27p. NTIS, PC A03/MF A01.

Based on laboratory and preliminary field tests of off-the-shelf steel-toed rubber boots, a molded sole design was developed to provide increased traction over conventional calendared sole miners boots. The pattern provided sharp edges perpendicular to both lateral and fore-aft slip vectors. The sole was designed to reduce mud caking. An instep lace-up capability was added to better secure the foot inside the boot. A 5-month field evaluation compared the prototype boots to the boots the participants usually wear.

0130 Transport And Handling

REFER ALSO TO CITATION(S) 48532, 49269

48573 **(DOE/EIA—0399) Railroad deregulation: impact on coal.** Tukenmez, E. (USDOE Energy Information Administration, Washington, DC. Office of Coal, Nuclear, Electric and Alternate Fuels). Aug 1983. 60p. NTIS, PC A04/MF A01. Order Number DE83016474.

Recent railroad legislation exemplified by the Staggers Rail Act has aimed generally at improving the profitability of the railroads through pricing flexibility and operating changes. The evolution of railroad legislation through the 1970's has indicated a concern about the revenue adequacy of the railroads and the regulatory burden under which the railroads were forced to operate for many years. Over the past two-and-a-half years the railroads generally have been pleased with the results of the Staggers Act. Coal producers and consumers, however, are dissatisfied with the ICC's implementation of the Act. In April 1982, bills were introduced in Congress to clarify provisions of the Staggers Act dealing with market dominance, revenue adequacy, and establishment of coal rate guidelines, in order to protect captive shippers.

48574 **(DOE/EIA—0400) Port deepening and user fees: impact on US coal exports.** Schnapp, R.M.; Hong, B.D. (USDOE Energy Information Administration, Washington, DC. Office of Coal, Nuclear, Electric and Alternate Fuels). May 1983. 41p. NTIS, PC A03/MF A01. Order Number DE83016074.

This analysis considers the effect on US coal exports in 1990 of user fees for: (1) operations and maintenance, and (2) deepening selected coal ports in order to permit the use of larger colliers. Of the many cost-sharing/user-fee proposals offered, this analysis focuses on two bills, S. 809 in the Senate, and H.R. 4627 in the House of Representatives, both introduced in the 97th Congress, and a third proposal drafted by the US Army Corps of Engineers, the federal agency charged with maintaining port channels.

48575 (EPRI-EA—3015, pp 8.1-8.21) **Regulatory reform and the public interest: the case of coal transport.** Gellman, A.J.; Allen, W.B.; Berardino, F.J. (Gellman Research Associates, Inc., Jenkintown, PA). May 1983. NTIS, PC A12/MF A01. (CONF-811285—Exc.).

From EPRI fuel supply seminar; Memphis, TN, USA (8 Dec 1981).

The Interstate Commerce Commission has instituted a number of proceedings to interpret the changes in railroad regulation mandated by the Staggers Rail Act of 1980. The most significant change pertains to the forthcoming Interstate Commerce Commission decision concerning how railroads may set rates for market-dominant traffic. Various possible pricing alternatives, including the revolutionary proposal made by the railroad industry to institute Ramsey pricing are discussed. Specific alternatives are offered that would both improve railroad financial positions and minimize the adverse effects of new pricing arrangements on specific shipper groups. 2 figures, 3 tables.

48576 **(PB—83-197889) Analysis of selected problems related to transportation of Illinois coal.** Bryce, D.E.; Braeutigam, R.R.; Ancar, R.P.; Griffin, C.S. (Illinois Univ., Urbana (USA). Dept. of Civil Engineering; Illinois Dept. of Energy and Natural Resources, Springfield (USA)). Dec 1982. 200p. NTIS, PC A09/MF A01.

Part one of this study examines and evaluates prospects and determinants of the export market for Illinois coal and identifies trade barriers and the necessary transportation investments. Part two of the study identifies and assesses some of the potential consequences that a coal slurry pipeline to Georgia, Florida and Alabama might generate for Illinois. Part three is an analysis of past and planned usage of coal by electric utilities with respect to Illinois.

48577 **(PB—83-202010) Coal preparation survey. Final report Feb 82-Aug 82.** Beaton, S.; Hall, R.R. (GCA Corp., Bedford, MA (USA)). Aug 1982. 58p. (GCA-TR—82-36-G). NTIS, PC A04/MF A01.

GCA identified 165 physical coal cleaning plants with a raw coal capacity of 500 tons/hr or greater. Of these 165 plants, additional information on the sulfur and ash content of the raw and prepared coals was collected for 49 coal preparation plants. Calculations were performed to determine the percent sulfur and ash reduction due to physical coal cleaning processes. The reduction in sulfur content varied from 0 to 57 percent by weight while the reduction in ash content varied from 10 to 85 percent by weight. These values are well within the range of results previously reported in the literature.

48578 **(PB—83-217794) Cleaned coal. Report for Jul 81-Jan 83.** Kilgroe, J.D. (Environmental Protection Agency, Research Triangle Park, NC (USA). Industrial Environmental Research Lab.). Jun 1983. 150p. (EPA—600/D-83-051). NTIS, PC A07/MF A01.

The chapter summarizes information on U.S. coal resources, describes physical coal cleaning technology, and discusses the potential for desulfurizing U.S. coals by physical techniques. It presents the costs of physical coal cleaning, summarizes the amounts of cleaned coals which can comply with different emission standards, and discusses the effects of coal sulfur variability on determining compliance coal properties. Finally, sample calculations are given for estimating the use of a given coal for compliance with various SO_2 emission regulations.

0140 Combustion

REFER ALSO TO CITATION(S) 49313

48579 **(IS-T—1056) Experimental gas-solid reaction kinetics of lime sulfation.** Marsh, D.W. (Ames Lab., IA (USA)). Jun 1983. Contract W-7405-ENG-82. 212p. NTIS, PC A10/MF A01. Order Number DE83016141.

Thesis.

Results from TGA confirmed that sulfation of CaO produces different products at different reaction conditions. In the presence of oxygen, above 740°C, the product is all $CaSO_4$ and the reaction is first order in SO_2 concentration. At 836°C, the reaction rate constant is 0.076 cm/s with an activation energy of 19.1 kcal/mole. Below 450°C, the major product is $CaSO_3$ and the reaction is zero order. The zero order reaction rate constant at 450°C is 4.2×10^{-8} cm/s with an activation energy of 15.4 kcal/mole. The grains of CaO obtained by calcining $Ca(OH)_2$ contained micropores, with a large number of them around 22 A in radius. The effect of sintering and sulfation on the micropores was studied using mercury porosimetry. At 932°C, the solid-state diffusivity was found to be 40×10^{-9} cm^2/s with an activation energy of 35.6 kcal/mole. Reaction measurements on sintered and unsintered CaO pellets showed that the temperature for maximum conversion increased with either increasing initial porosity or increasing initial grain size. A one-dimensional expanding grain model, applied to the lime pellet sulfation data, fit the data from highly sintered pellets quite well.

0150 Marketing And Economics

REFER ALSO TO CITATION(S) 48568, 48569, 48603, 49264, 49271

48580 **(EPRI-EA—3015, pp 2.1-2.26) Overview on coal prospects.** Gordon, R.L. (Pennsylvania State Univ., University Park). May 1983. NTIS, PC A12/MF A01. (CONF-811285—Exc.).

From EPRI fuel supply seminar; Memphis, TN, USA (8 Dec 1981).

The paper has three main goals: suggesting the value and limitations of forecasts, recapitulating the forecasts, and discussing the difficulties of determining the reason the forecasts differ. The most obvious implication of the coal forecasts is that coal remains a far better alternative for electric power than oil or gas. However, the position of coal relative to nuclear cannot yet be resolved. The forecasts do not sustain either those who would argue that nuclear has become clearly inferior to coal or those who believe that rising problems with coal use will make heavy use of nuclear power indispensable. 7 tables.

48581 **(EPRI-EA—3015, pp 3.1-3.12) Outlook for coal in the next twenty years.** Stauffer, C.H. Jr.; Klein, D.E. (ICF Inc., Washington, DC). May 1983. NTIS, PC A12/MF A01. (CONF-811285—Exc.).

From EPRI fuel supply seminar; Memphis, TN, USA (8 Dec 1981).

In developing short-term market forecasts, year-by-year estimates covering the period from 1981 to 1985 by examining key sectors of the coal market have been prepared. These estimates rely heavily on data collected for coal mines, powerplants, non-utility uses, coal supply contracts, and other data bases. To develop the longer-term forecasts, a Coal and Electric Utilities Model (CEUM) is utilized. While both the short- and long-term forecasts presented in this analysis use different analytic procedures, both of them are similar in that they rely heavily on detailed coal market data developed by the government and other organizations. 7 tables.

48582 **(EPRI-EA—3015, pp 4.1-4.24) Crystal-ball gazing: fathoming the future of coal.** Major, R.L. (Data Resources, Inc., Cambridge, MA). May 1983. NTIS, PC A12/MF A01. (CONF-811285—Exc.).

From EPRI fuel supply seminar; Memphis, TN, USA (8 Dec 1981).

The outlook for coal as an energy source for the industrialized world is bright. Its widespread availability at prices below those projected for oil and natural gas should lead to a return to coal in many sectors and regions. Despite growth in the industrial, synfuels, and export markets, electric utilities will continue to dominate the market for coal through the end of the century. The price of coal will continue to be cost-based because of the vigorous competition among suppliers within the United States and other countries. The gap between oil, gas, and coal prices will remain and will widen over time. This increased price advantage will be more than sufficient to pay for higher transportation and pollution control costs associated with coal use. 5 figures, 11 tables.

48583 **(EPRI-EA—3015, pp 5.1-5.12) Prospects for coal development.** Keady, F.D.; Rimstidt, D.L. (Old Ben Coal Co., Chicago, IL). May 1983. NTIS, PC A12/MF A01. (CONF-811285—Exc.).

From EPRI fuel supply seminar; Memphis, TN, USA (8 Dec 1981).

Because of higher oil and gas prices, coal will continue to be the lowest-priced energy source in the United States. Major shifts in energy use will occur due to the high cost of petroleum, the suitability of natural gas for residential and commercial use, and the relative economics of coal for use in large stationary industrial and utility boilers. Coal demand in the United States is expected to more than double over the next twenty years with the most growth in the utility and industrial sectors. Regional studies were conducted to determine the coal resources in each producing region: Illinois Basin, Northern Appalachia, and the Powder River Basin. Each of these is discussed. Coal can substantially replace oil and gas as boiler fuels and supply the expected growth in United States

and world energy requirements; but coal producers and consumers alike must gain a working knowledge of the mechanisms behind the dynamics of coal and the depletion of other resources. 10 figures, 1 table.

0160 Health And Safety

REFER ALSO TO CITATION(S) 48554, 48556, 48558, 48560, 48561, 48562, 48565, 48566, 48567, 48572, 48589, 49808, 50072, 50081

48584 (DOE/ET/14746—11) Influence of coal devolatilization conditions on the yield, chemistry, and toxicology of by-product oils and tars. Fillo, J.P.; Stamoudis, V.C.; Stetter, J.R.; Vance, S.W. (Environmental Research and Technology, Inc., Pittsburgh, PA (USA); Argonne National Lab., IL (USA); Mellon Inst., Pittsburgh, PA (USA)). Mar 1983. Contract W-31-109-ENG-38;AC01-80ET14746. 250p. (ANL/SER—2). NTIS, PC A11/MF A01. Order Number DE83016417.

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The present experimental program investigated the effects of process conditions on the yield, chemical composition, and toxicological characteristics of oil/tar produced during the devolatilization of coal. Experiments were conducted in a 2-lb/hr, entrained-flow reactor. Chemical and toxicological analyses were performed on samples from 49 separate experiments. Rapid gas chromatographic analysis methods were applied to the complex oil/tar by-products to accurately identify over 100 individual chemical compounds. Reactor condensate samples, including tars, oils and aqueous materials, were screened using the Ames Salmonella assay. Selected materials were subjected to sister chromatid exchange and rabbit alveolar macrophage assay procedures. Results indicate that: (1) in the range 600°C to 1000°C, temperature and reactant gas had the most substantial effect on yields of oil/tar. (2) The chemical composition of bulk oil/tar varied considerably, consisting mostly of aromatic compounds with 4 or more rings at 600°C and 1 to 3 rings at 1000°C. (3) The production of selected classes of compounds varied with both temperature and residence time. (4) The highest values of mutagenicity were measured for reactor condensates produced at 800°C; oil/tar produced at 600°C contained low or statistically insigificant mutagenicity. (5) The mutagenicity of by-product oil/tar varied with the presence of specific classes of compounds, particularly azaarenes plus primary aromatic amines.

48585 (MESA-IR—1029) Summary of some selected underground coal-mine-face-machinery fatalities-1973. Wancheck, G.A. (Mining Enforcement and Safety Administration, Pittsburgh, PA (USA). Pittsburgh Technical Support Center). 1975. 26p. NTIS, PC A03/MF A01. Order Number DE83902970.

This Mining Enforcement and Safety Administration report gives a brief description of face machinery accidents that occurred during 1973. Accidents are grouped into 10 major categories as follows: (1) Pushing or Pulling mine equipment with other equipment; (2) performing tasks under unblocked elevated equipment; (3) operator of self-propelled equipment not facing direction of travel; (4) tramming self-propelled face equipment through check curtains; (5) overhanging brows or rib rolls; (6) electrical shock; (7) work activity in proximity to blasting operations; (8) unattended equipment; (9) changing bits on energized equipment; and (10) unsafe position near moving equipment. These accident categories were selected in preference to the usual accident classifications of unsafe act, unsafe condition, or unsafe equipment in order to identify and pinpoint the act or task involved at the time of the accident. By doing this, we are hopeful that the accident causes may be determined and corrective measures implemented more readily. Many of the accidents are similar in nature and are repetitive. Therefore, by identifying these accidents in specific categories, we hope to be in a much better position to propose and promugate safety criteria that will be acceptable and practiced throughout the underground coal mining industry. This descriptive summary is based on Federal coal mine inspectors' reports of face machinery fatalities for the year 1973. The report is primarily designed for use in the safety education and training of mining personnel, directly or indirectly involved in the production of coal in underground coal mines. It also should be of value for evaluating and proposing safety criteria for reducing fatalities.

48586 (MESA-IR—1032) Meeting mandatory federal health standards under difficult dust-control conditions. Pendergast, J.J.; Cox, T.A.; Sutherland, W.H. (Mining Enforcement and Safety Administration, Richlands, VA (USA). Coal Mine Health and Safety District 5; Mining Enforcement and Safety Administration, Arlington, VA (USA). Coal Mine Health and Safety). 1976. 31p. NTIS, PC A03/MF A01. Order Number DE83902967.

Respirable dust measurements made by coal mine inspectors during the first year of enforcement of the Coal Mine Health and Safety Act of 1969 established that the high-risk dust concentrations on the four longwall plows operating in Virginia were in the range of 6 to 12 miligrams of respirable dust per cubic meter of air (mg/m^3). The highest concentrations were in the Beatrice Pocahontas Co.'s Beatrice Mine, which operates in the Pocahontas No. 3 coalbed. The Department of the Interior and Beatrice Pocahontas Co. cooperated in experimenting with various types of dust control methods on Beatrice Mine's No. 3 longwall plow (section 012) during a 7 month period. This report outlines chronologically the use of several sets of dust control methods that resulted in reductions in respirable dust levels.

48587 (MSHA/IR—1118) Evaluation of two light-scattering respirable dust monitors. Thompson, E.M.; Treaftis, H.N.; Tomb, T.F.; Beckert, A.J. II. (Mine Safety and Health Administration, Pittsburgh, PA (USA). Pittsburgh Technical Support Center). 1980. 17p. NTIS, PC A02/MF A01. Order Number DE83902851.

This report describes the laboratory and field evaluation of two light-scattering dust monitors with instantaneous readout. One instrument, the Tyndallometer TM-Digital, was developed at the Mining Research Establishment of the Steinkohlenbergbauverin in Essen, West Germany. The other instrument, known as the SRI, was developed under three US Bureau of Mines research contracts. The TM-Digital is designed so that its response is proportional to the volume of fine dust which can be deposited in the lungs, while the SRI instrument can be used to measure total or respirable dust concentrations. Dust measurements obtained with both instruments were compared to those obtained using the approved coal mine respirable dust sampler. Comparative measurements were made in the laboratory using aerosols of coal, limestone, silica, and Arizona road dusts, and in three underground coal mines. The results showed that mass concentration measurements obtained with both the SRI and Tyndallometer TM-Digital are linearly related to those obtained with the coal mine respirable dust samplers. In the laboratory evaluation, the response of the SRI was found to be dependent on the characteristics of the aerosol sampled. The relationship established using comparative measurements for all aerosols was: SRI = 0.28 + 0.67 personal sampler. The relationship derived for comparative mass measurements with the TM-Digital was: TM-Digital = 0.06 + 0.81 personal sampler for the laboratory aerosols. In contrast to the SRI, the response of the TM-Digital is relatively insensitive to variations in particulate composition and size distribution. It was concluded that for the particulate aerosols tested, these new light-scattering dust monitors will give measurements linearly related to those obtained with approved personal samplers. The improved version of the SRI and the current model of the Tyndallometer TM-Digital should both be useful tools for assessing underground coal mine dust concentrations.

48588 (PB—83-182154) National Institute for Occupational Safety and Health certified equipment list as of February 17, 1983. (National Inst. for Occupational Safety and Health, Cincinnati, OH (USA)). 17 Feb 1983. 304p. NTIS, PC A14/MF A01.

The National Institute for Occupational Safety and Health, under authorization of the Federal Mine Safety and Health Act of 1977 and the Occupational Safety and Health Act of 1970, provides a testing, approval, and certification program assuring commercial availability of safe personal protective devices and reliable industrial hazard measuring instruments. NIOSH develops improved performance regulations, tests and certifies (or approves) devices, and

purchases approved and certified products on the open market to verify the quality of manufacture. This publication (a) lists products certified as of February 17, 1983, (b) contains tables of useful information concerning certified coal mine dust personal sampler units, detector tube units, sound level meter sets, respirators, (c) updates the lists of approval applicants, and (d) provides a list of test procedures for certification of the above products.

0170 Legislation And Regulations

REFER ALSO TO CITATION(S) 49854

48589 **(MESA-IR—1060) Compilation of judicial decisions which have an impact on coal-mine inspections.** Cleveland, M.J.; Turner, E. (National Mine Health and Safety Academy, Beckley, WV (USA); Mining Enforcement and Safety Administration, Arlington, VA (USA). Coal Mine Health and Safety). 1977. 159p. NTIS, PC A08/MF A01. Order Number DE83903033.

A compilation of extracts from pertinent decisions of the Office of Hearings and Appeals, US Department of the Interior, and the federal courts on matters pertaining to the enforcement of the Federal Coal Mine Health and Safety Act of 1969 is presented. Decisions through October 15, 1976, are included.

48590 **(NP—3770328) Energy policy in the Saarland.** Huegel, E. (Staatskanzlei des Saarlandes, Saarbruecken (Germany, F.R.). Abt. Presse und Information). 20 Oct 1982. 7p. (In German). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83770328.

The pamphlet gives an explanation of the Land's energy policy from the politicians point of view and outlines its aims as regards coal mining, electric power generation from coal and coal upgrading as well as with regard to nuclear energy, natural gas, energy conservation and district heating. In the Saarland's energy policy, the region's back coal mining continues to be a factor of eminent importance.

02 PETROLEUM

0202 Geology And Exploration

REFER ALSO TO CITATION(S) 49866

48591 **(DOE/CE/15127—T3) Magneto-electric exploration. Final technical progress report.** (Independex, Inc., Dallas, TX (USA)). 1983. Contract FG01-82CE15127. 49p. NTIS, PC A03/MF A01. Order Number DE83016239.

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The primary task of this program was to develop a statistical track record for the process of Magneto-electric exploration, with a secondary task of evaluating the acquired data, and utilizing that data for any refinements necessary to the improvement of the process, adjustments to the procedure, determination of criteria of the value intensities as they apply to hydrocarbon productive and non-productive areas, and in essence, provide controlled data to evaluate the present state of the interpretive procedure of Magneto-electrics. To develop the statistical record, Independex contacted numerous oil and gas exploration companies and requested that they submit an area where they were drilling or about to commence a wildcat well, so that we could conduct a ground magnetic survey and process our results prior to the actual results from their operations. The results of the sampling projects indicate a very high predictive capability to date, for the process of Magneto-electric exploration, based on the sampling of 20 wells drilled during this report period. Of the 20 wells drilled, 6 wells have been reported as producers, which is a 30% confidence ratio, and which corresponds with the oil and gas industry's recent years track record for exploratory wells. The controlled sampling under this project has demonstrated a 83.3% confidence ratio in predicting producing wells, but is only representative of initial wells drilled on each project anomaly. It can be concluded from this project that the correlation between oil and gas accumulations and Magneto-electric surveys is very close, and that Magneto-electrics can be an important exploration technique to delineate areas favorable for oil and gas accumulation, reduce risk in wildcat exploration and provide an integral part to a combined exploration program. 19 figures, 3 tables.

48592 **(INIS-mf—8152) Isotope fractionation of stable carbon by the example of petroleum from the South-German molasse basin.** Graf, W. (Technische Univ. Muenchen (Germany, F.R.). Fakultaet fuer Chemie, Biologie und Geowissenschaften). 21 Dec 1979. 94p. (In German). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702760.

Thesis.

A theoretical model is used to try and explain the $^{13}C/^{12}C$ isotope fractionation between the hydrocarbon groups of petroleum to clarify its origin. Experimentally found isotope fractionations were compared with those assessed by a Galimov approximation method. The results enable one to group the South-German molasse basin petroleum into four regional groups. (HP).

48593 **(NP—3770329) Investigation of critical influencing factors and novel system components in coring.** Nawangsidi, D. (Technische Univ. Clausthal, Clausthal-Zellerfeld (Germany, F.R.). Fakultaet fuer Bergbau, Huettenwesen und Maschinenwesen). 14 Feb 1980. 107p. (In German). NTIS (US Sales Only), PC A06/MF A01. Order Number DE83770329.

Portions are illegible in microfiche products; Thesis.

The studies on influencing parameters in coring comprise: Hydraulic connection between inner and outer tube, forces acting on unsolidified sand upon entering the inner tube, testing of a new core catcher device and a novel type of bending shaft for drilling motors. Finally, the drilling-in phase in horizontal coring is regarded.

0203 Drilling And Production

REFER ALSO TO CITATION(S) 48613

48594 **(DOE/BC/10344—8) Investigations of enhanced oil recovery through use of carbon dioxide. Second annual report, October 1, 1981-September 30, 1982.** Monger, T.G.; McMullan, J.H. (Louisiana State Univ., Baton Rouge (USA). Dept. of Petroleum Engineering). Aug 1983. Contract AS19-80BC10344. 98p. NTIS, PC A05/MF A01. Order Number DE83015656.

Research at Louisiana State University is keyed to the development of a basic understanding of the mechanism(s) by which miscibility is generated between injection fluid and reservoir oil. The general objective of the research is to provide data which will facilitate the selection of reservoirs amenable to CO_2 flooding and optimize attendant field operating procedures. On the reservoir scale, CO_2 flood performance is dictated by a number of variables such as temperature, pressure, injection fluid composition, oil composition, the presence and distribution of an aqueous phase, plus geological factors. Our research approach is to delineate the effects of these variables by interrelating oil recovery, phase behavior, and fluid property studies. The phase behavior of forty-three mixtures of synthetic oil and carbon dioxide are described. Significant results show that the phase equilibria determined for mixtures of CO_2 with simple synthetic oils generally emulate that reported for complex natural crude oils. Hydrocarbon compositional effects are discussed in terms of their chemical or physical nature. Chemical effects correlate with the oil's aromatic content or the molecular type, while physical effects reflect molecular packing and can be correlated with oil density. Oil recoveries from twenty-two slim-tube displacements of dead Brookhaven oil, and one slim-tube displacement of live Brookhaven oil using 100% CO_2 as an injection fluid are described. 19 figures, 6 tables.

48595 **(DOE/BETC—83/2) Contracts for field projects and supporting research on enhanced oil recovery and improved drilling technology. Progress review No. 34, quarter ending March 31, 1983.** Linville, B. (ed.). (USDOE Bartlesville Energy Technology Center, OK). Jul 1983. 92p. NTIS, PC A05/MF A01. Order Number DE83017026.

Progress achieved for the quarter ending March 1983 are presented for field projects and supporting research for the following: chemical flooding; carbon dioxide injection; and thermal/heavy oil. In addition, progress reports are presented for: resource assessment technology; extraction technology; environmental and safety; microbial enhanced oil recovery; oil recovered by gravity mining; improved drilling technology; and general supporting research. (ATT)

48596 **(DOE/BETC/QPR—83/1) Liquid fossil-fuel technology. Quarterly technical progress report, January-March 1983.** Linville, B. (ed.). (USDOE Bartlesville Energy Technology Center, OK). Jul 1983. 75p. NTIS, PC A04/MF A01. Order Number DE83017024.

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Accomplishments for the quarter ending March 1983 are presented under the following headings: liquid fossil fuel cycle, processing, utilization, and project integration and technology transfer. Feature articles for this quarter are: (1) abandoned oil field reports issued; (2) oilfield water data bank report published; (3) microbial enhanced recovery report issued; (4) polymer-augmented project could be economic today; (5) carbon dioxide EOR estimates given; (6) BETC passes 65th milestone; and (7) fifty achievements for fifty years (1918-1968). BETC publications are also listed. (ATT)

0204 Processing

REFER ALSO TO CITATION(S) 48596

48597 **(BMFT-FB-T—83-090) Upgrading of heavy oils by hydrogenation.** Graeser, U.; Niemann, K.; Kretschmar, K. (Bundesministerium fuer Forschung und Technologie, Bonn (Germany, F.R.)). May 1983. 50p. (In German). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83751102.

In bench-scale experiments, vacuum residues as well as heavy crudes were processed by the VEBA-LQ-respectively VEBA-Combi-Cracking to low boiling products as naptha, middle distillate and vacuum gas oil. Residue-conversions higher than 90% were easily obtained without addition of one-way-catalysts. In a directly linked gas-phase reactor the products were extensively desulphurized and denitrified by the use of modern hydrotreatment-catalysts. The influence of different parameters on the degree of conversion and on the product quantity/quality was tested. There was a good reproducibility of the experimental results. For the VEBA-Cracking-Processes and the similar LURGI-DSV-Process the basic design of a 1 ton/hr pilot plant was performed.

0205 Products And By-products

48598 **(AD-A—129083/2) (31)P-NMR analysis of zinc dialkyl(diaryl)-dithiophosphate in lubricating oil. Final report.** Chen, S. (Army Mobility Equipment Research and Development Center, Fort Belvoir, VA (USA)). Nov 1982. 29p. (MERADCOM—2372). NTIS, PC A03/MF A01.

To assure that the oils furnished the government are of the same formulations as the oils originally qualified, a new method has been developed to examine zinc dialkyl(diaryl)dithiophosphate (ZDDP) additives by using P-NMR. Two finished oils and primary alkyl-ZDDP, secondary alkyl-ZDDP, and aryl-ZDDP were examined. P-NMR was found to be a better method than other existing analytical methods to analyze the change of ZDDP additives in full formulated oil without pre-separation.

0206 Health And Safety

REFER ALSO TO CITATION(S) 48774, 50067

48599 **(PB—83-178855) Health and safety guide for oil and gas well drilling and servicing.** (National Inst. for Occupational Safety and Health, Cincinnati, OH (USA)). Aug 1980. 72p. (DHEW/PUB/NIOSH—78-190). NTIS, PC A04/MF A01.

The purpose of this guide is to assist in providing a safe and healthful workplace. It describes safe practices and points out some of the more frequently encountered violations of the health and safety standards as regards oil and gas well drilling and servicing. This book includes a section titled 'Health and Safety Guidelines', which includes the recommendations of good practices, and a section of 'Frequently Violated Regulations', which generally follows the order and content of the OSHA Standards. On the last few pages of this guide, addresses of NIOSH and OSHA regional offices are listed. Also included are addresses of other organizations which can provide assistance and information on occupational safety and health.

48600 **(SI-R—820806-1) Development of a new method for monitoring crack formation in offshore structures. Status report - invitation to participate.** Hognestad, H. (Sentralinstitutt for Industriell Forskning, Oslo (Norway)). Sep 1982. 23p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83750968.

The proposed method for discovering cracks and monitoring their growth in offshore steel structures is based on measurements of the electrical field set up in the structure by an impressed electric current - a new version of the potential drop technique. Sufficient evidence is obtained by the research already done, to state that the concept represents a promising method for structural monitoring of mobile rigs and jacket platforms.

0207 Marketing And Economics

REFER ALSO TO CITATION(S) 49271, 49448

48601 **(DOE/EI/11549—T1) Home-heating-oil price-monitoring report, June 1982-May 1983.** (Maine Office of Energy Resources, Augusta (USA)). 1983. Contract FG01-82EI11549. 10p. NTIS MF A01. Order Number DE83016539.

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The pattern of price increases and decreases during the 1982-1983 heating year followed very closely the pattern established during the previous year. For both years, prices rose in the fall, fell during the winter, and rose again in the spring. This pattern has been caused by speculation over declining crude oil prices and continued conservation and slack demand for distillate product. Kerosene prices fluctuated the same as heating oil prices. (PSB)

48602 **(DOE/EIA—0380(83/07)) Petroleum marketing monthly.** (USDOE Energy Information Administration, Washington, DC. Office of Oil and Gas). Jul 1983. 86p. NTIS, PC A05/MF A01 - GPO. Order Number DE83016650.

Information and statistical data about a variety of petroleum products, including motor gasoline, distillates, residuals, jet fuel, kerosene, and propane are given for the 50 States and the District of Columbia. Petroleum products sales statistics are tabulated for use by industry, government, and private sector analysts, educational institutions, and consumers. Data are for May 1983.

48603 **(DOE/EIA—0408(82)) Supplement to the 1982 Annual Energy Outlook.** (USDOE Energy Information Administration, Washington, DC. Office of Energy Markets and End Use). Jul 1983. 348p. NTIS, PC A15/MF A01. Order Number DE83016529.

This supplement to the 1982 Annual Energy Outlook contains additional detail on the forecasts and assumptions presented in the main volume. It is presented in four parts, which provide: (1) an introductory overview of the model; (2) a discussion of the methodology and the calculation procedures; (3) a list of the key assumptions used in the model; and (4) the full forecast listings from the model results. The model used in the forecasts is called the Intermediate Future Forecasting System (IFFS). It is designed to provide year-by-year forecasts of all fuel interactions in the marketplace on a national basis to the year 1990. Although many of the calculations are made on a regional basis, the results are combined

to provide a more accurate picture at the national level. The modelling system IFFS is designed to show trends in energy markets and their underlying causes. Although the model includes some new technologies, it emphasizes the major fuels, incorporating domestic supplies by producers of oil, gas, and coal, and imports of crude oil, refined petroleum products, and natural gas. It contains a representation of the principal conversion activities: refineries and electric utilities. End-use demand by consumers is projected for natural gas, electricity, coal, distillate fuel oil, residual fuel oil, gasoline, jet fuel, liquefied petroleum gases, petrochemical feedstocks, and other petroleum products.

48604 **(PB—83-188649) Trends in the supply and price of residual fuel oil in the United States energy system. Final report.** Heinen, R.G.; Intille, G.M.; Coady, T.M.; Poynter, C.D. (Pace Co. Consultants and Engineers, Inc., Houston, TX (USA); Gas Research Inst., Chicago, IL (USA)). Jan 1983. 288p. NTIS, PC A13/MF A01.

The report provides historical data on the supply, demand, and pricing of residual fuel oil in the United States. Forecast projections are made through the year 2000. Refinery economics, oil imports and exports, oil consumption by end use sectors are provided.

0209 Environmental Aspects

REFER ALSO TO CITATION(S) 49870

48605 **(AD-A—126395/3) Aerial photographic surveys analyzed to deduce oil spill movement during the decay and breakup of fast ice, Prudhoe Bay, Alaska. Final report.** Lissauer, I.M.; Baird, D.A. (Coast Guard Research and Development Center, Groton, CT (USA); Coast Guard, Washington, DC (USA). Office of Research and Development). Sep 1982. 59p. (CGR/DC—21/82). NTIS, PC A04/MF A01.

During the summers of 1979 and 1980 aerial photographs of the land fast ice north of Prudhoe Bay, Alaska, were taken. These photographs, covering two-week periods, highlight the decay and break-up of the land fast ice sheet. During the period of photography, wind speed, wind direction, barometric pressure, and tidal height measurements were recorded continuously. Several larger ice floes were 'tagged' with colored plywood markers during 1979. Both these marked flows and other distinctively shaped floes were tracked on the photographic surveys to determine the effect the wind had on their movement. Within the barrier islands, average ice floe velocities as a percentage of wind speed exceeded the 3.5% figure 'normally' found in the literature. North of these islands average ice floe velocities as a percentage of wind speed were less than the 3.5% value. In addition to the flow drift calculations the photographs provide information on melt pool formation and a comparison of the decay and breakup processes between the 1979 and 1980 seasons. The decay and breakup process appears to be triggered by strong wind events in early July.

48606 **(SI-R—820225-1) Oil spill combat: Damage assessment using multiattribute utility analysis.** Fredrikson, G.W.; Ibrekk, H.; Johannessen, K.I.; Kveseth, K.; Seip, H.M.; Seip, K.L.; Wenstoep, F. (Sentralinstitutt for Industriell Forskning, Oslo (Norway)). Sep 1982. 90p. NTIS (US Sales Only), PC A05/MF A01. Order Number DE83750967.

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The work reported is a part of a more comprehensive study aimed at improving both preparedness for coping with oil pollution and oil spill combat operations. The report deals primarily with the problem of comparing damage types; some of them may at the outset seem noncomparable. A short description of multiattribute utility analysis is given. Maximization of total utility is not necessarily identical to maximization of net value (net benefit) of an action. It may, however, be an acceptable approximation for oil spill problems. Damage caused by oil spills is described in terms of eleven parameters or attributes such as restitution time for affected shores, reduced possibilities for recreation, effects on birds (number of birds killed and restitution time for populations) and damage to industry and fishery. The approach is illustrated by several examples, both historical oil spills and hypothetical scenarios. The calculations indicate that combat actions designed to protect vulnerable areas may be the best choice in many cases. It is belived that systematic manner in which the overall goal is broken down into measurable attributes represents a sound and necessary way of approaching multi-objective problems of the kind discussed. 11 drawings, 12 tables.

0210 Legislation And Regulation

REFER ALSO TO CITATION(S) 48599

0220 Transport, Pipelines, And Handling

REFER ALSO TO CITATION(S) 49997

0230 Properties

REFER ALSO TO CITATION(S) 48596

48607 (LBL—15295, pp 1.24-1.31) **Molecular characterization and fingerprinting of vanadyl porphyrin and non-porphyrin compounds found in various heavy crude petroleums and their asphaltenes.** Fish, R.H.; Komlenic, J.J.; Wines, B.; Vermeulen, T. Jun 1983. NTIS, PC A04/MF A01. Contract AC03-76SF00098.

In Energy & Environment Division annual report. Chemical process research and development program, FY 1982.

Processes are described for the speciation of unidentified vanadyl compounds in heavy crudes and their asphaltenes using HPLC coupled with a graphite furnace atomic absorption spectrometer (GFAA). Comparisons of Boscan, Cerro Negro, Wilmington, and Prudhoe Bay heavy crude oils based on HPLC-GFAA fingerprints are reported. Highlights of accomplishments during 1982 and planned activities for 1983 are summarized. (DMC)

0240 Storage

REFER ALSO TO CITATION(S) 48549

0250 Combustion

48608 **(AD-A—128773/9) Water-in-oil emulsion as a boiler fuel. Final report Oct 81-Sep 82.** Fu, T.T. (Naval Civil Engineering Lab., Port Hueneme, CA (USA)). Jan 1983. 56p. (NCEL-TN—1653). NTIS, PC A04/MF A01.

Extensive tests have been conducted in an in-service boiler to determine the measurable benefits of firing water in no. 6 oil emulsions. Emulsions of 3%, 6%, 9%, and 12% water concentrations have been fired during normal boiler operations. Although the emulsions could be fired satisfactorily without modifications to boiler equipment, the test results show that improvements, if any, in overall boiler efficiency or emissions were ambiguous.

48609 **(PB—83-213470) Thermal radiative ignition of liquid fuels by a CO_2 laser. Final report 1 Oct 79-30 Sep 82.** Kashiwagi, T.; Ohlemiller, T.J.; Kashiwagi, T.; Jones, W.W. (National Bureau of Standards, Washington, DC (USA). Center for Building Technology; Bureau of Mines, Washington, DC (USA)). May 1983. 82p. (NBSIR—83-2689). NTIS, PC A05/MF A01.

This report summarizes progress in the study of the ignition mechanism of a liquid fuel by CW CO2 laser; the period covered is from October 1, 1979 to September 30, 1982. It describes (1) new observations of liquid fuel behavior near and at the liquid/air interface during the laser irradiation with incident fluxes from 260 to 2500 W/sq cm, (2) new time-resolved measurements of distributions of temperature and vapor concentration in the gas phase using a newly-developed, high speed, two-wavelength holographic interferometer and (3) the development of a technique to measure infrared absorption spectra of fuel vapors at elevated temperatures.

03 NATURAL GAS

0302 Geology And Exploration

REFER ALSO TO CITATION(S) 48591, 49866

0305 Health And Safety

48610 **(PB—83-217885) Identification of safety related research and development needs for CNG (compressed natural gas) vehicle fuel systems. Final report Dec 82-Mar 83.** Joyce, T.J. (Joyce (T.) Associates, Inc., Fairfax, VA (USA); Gas Research Inst., Chicago, IL (USA)). May 1983. 71p. NTIS, PC A04/MF A01.

The principal safety issues which concern CNG suppliers, users and government officials were identified. A prioritized listing of safety related R and D projects which would alleviate the concerns was prepared. The safety concerns were identified by means of a mail survey of equipment suppliers, gas utilities, consumers and government agencies. Further information was obtained through follow-up interviews with respondents. The safety R and D conducted in the past or currently underway was reviewed. Existing and proposed safety regulations were analyzed to identify the R and D needed for the CNG industry to meet the requirements.

0306 Marketing And Economics

REFER ALSO TO CITATION(S) 48603, 49266

48611 **(DOE/EIA—0130(83/07)) Natural gas monthly.** (USDOE Energy Information Administration, Washington, DC. Office of Oil and Gas). Jul 1983. 150p. NTIS, PC A07/MF A01 - GPO. Order Number DE83016527.

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This recurring statistical compilation for the Natural Gas Industry covers data for: production; consumption; supplemental gaseous fuels; imports and exports' extraction loss; underground storage; major interstate pipeline company statistics; Natural Gas Policy Act; prices; estimated surplus; and an overview of the industry. Feature articles offer an overview of the Canadian natural gas situation plus an evaluation of US imports and exports during 1982. (PSB)

0310 Legislation And Regulation

REFER ALSO TO CITATION(S) 48611

0320 Transport, Pipelines, And Handling

REFER ALSO TO CITATION(S) 49266

04 OIL SHALES AND TAR SANDS

0404 Oil Production, Recovery, And Refining

REFER ALSO TO CITATION(S) 48617, 48618, 48619, 48619, 48620, 48621, 48622

48612 **(LBL—16018) Utilization of metals in oil-shale-retort components.** Levy, A.V. (Lawrence Berkeley Lab., CA (USA)). Nov 1982. Contract AC03-76SF00098. 172p. NTIS, PC A08/MF A01. Order Number DE83016380.

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A program was conducted to determine the behavior of candidate steel alloys in in-situ and above ground oil shale retort environments. Components from oil shale retorts that failed were analyzed to determine the nature of their corrosion caused failures. Metal specimens, both bare and surface aluminized, were exposed in large scale, simulated, in-situ retorts and analyzed. Laboratory crucible test exposures of small metal specimens in finely ground fresh shale were made at precise temperatures and times and analyzed. It was determined that the high sulfur content and reducing environment of in-situ retorts can catastrophically attack low alloy and stainless steels at temperatures near 1000°C (1800°F). In the lower temperature operating environments of above ground retorts, near 540°C, both low alloy and stainless steels undergo <20 mils/yr corrosion rates.

48613 **Assessment of research needs for oil recovery from heavy-oil sources and tar sands.** Penner, S.S.; Benson, S.W.; Camp, F.W. (Energy Center and Department of Applied Mechanics and Engineering Sciences, University of California, San Diego, La Jolla, CA 92093). *Energy (Oxford);* **7**: No. 7, 567-602(Jul 1982). Contract AC01-79ER10007.

The authors review and evaluate the U.S. programs on oil recovery from heavy oil sources and tar sands. These studies were performed in order to provide an independent assessment of research areas that affect the prospects for oil recovery from these sources. This paper summarizes finding and research recommendations.

0405 Properties And Composition

REFER ALSO TO CITATION(S) 49566

48614 (LBL—15295, pp 1.19-1.24) **Homogeneous catalytic hydrogenation: regiospecific reductions of polynuclear aromatic and heteroaromatic nitrogen compounds catalyzed by transition-metal carbonyl hydrides.** Fish, R.H.; Thormodsen, A.D.; Cremer, G.A.; Vermeulen, T.; Heinemann, H. Jun 1983. NTIS, PC A04/MF A01. Contract AC03-76SF00098.

In Energy & Environment Division annual report. Chemical process research and development program, FY 1982.

A wide variety of transition metal carbonyl compounds was reacted with anthracene, phenanthrene, and pyrene. Only $Fe(CO)_5$, $Mn_2(CO)_8(Bu_3P)_2$, and $Co_2(CO)_6(Q_3P)_2$ produced reaction products under watergas shift and synthesis for conditions. The stereochemistry of the anthracene reaction was studied. Reactions of polynuclear heteroaromatic nitrogen compounds were also studied under watergas shift and syngas conditions.

48615 (LBL—15295, pp 1.31-1.34) **Synthesis, structural elucidation, and stereochemistry of five-coordinate organoarsenic catecholates.** Fish, R.H.; Tannous, R.S. Jun 1983. NTIS, PC A04/MF A01. Contract AC03-76SF00098.

In Energy & Environment Division annual report. Chemical process research and development program, FY 1982.

Reactions of catechols with alkyl and arylarsonic acids were studied. An ORTEP diagram of the major isomer produced is shown and selected bond lengths and angles given.

48616 (LBL—15295, pp 1.34-1.37) **Organometallic geochemistry: isolation and identification of organoarsenic compounds from Green River formation oil shale.** Fish, R.H.; Tannous, R.S.; Walker, W.; Weiss, C.S.; Brinckman, F.E. Jun 1983. NTIS, PC A04/MF A01. Contract AC03-76SF00098.

In Energy & Environment Division annual report. Chemical process research and development program, FY 1982.

A sample of Green River Formation oil shale was analyzed for organic arsenic compounds using methanol extraction, HPLC, and GFAA. Electron impact mass spectroscopy following gas chromatography was used to study reactions of arsonic acids with catechols.

48617 **Composition of oils produced during an echoing, in-situ combustion of a Utah tar sand.** Thomas, K.P.; Barbour, R.V.; Branthaver, J.F.; Dorrence, S.M. (Laramie Energy Technology Center, PO Box 3395, Laramie, WY 82071). *Fuel;* **62**: No. 4, 438-443(Apr 1983).

The Laramie Energy Technology Center (DOE) has completed its second in-situ combustion experiment (TS-2C), which was carried out in the Northwest Asphalt Ridge tar sand deposit near Vernal, Utah. During the experiment (183 days) 92 m^3 (580 barrels) of oil was produced, 25% of the original oil in place. The in-situ

process utilized is best described as a series of reverse- and forwardcombustion phases or echoes traversing the 405 m^2 (0.1 acre) pattern. Several of the chemical and physical properties of the oil produced are significantly altered with respect to the original bitumen. These include pour point, specific gravity, average molecular weight, wax and nickel content, and the percentage of residue boiling at ≧538°C (1000°F). These and other changes effected on the bitumen durin this experiment result in a product oil that closely resembles a heavy fuel oil.

0408 Marketing And Economics

REFER ALSO TO CITATION(S) 49448

0409 Waste Research And Management

48618 **(LBL—16079) Evaluation of control technology for modified in-situ oil-shale retorts.** Persoff, P.; Fox, J.P. (Lawrence Berkeley Lab., CA (USA)). Apr 1983. Contract AC03-76SF00098. 10p. (CONF-830434—9). NTIS, PC A02/MF A01. Order Number DE83015997.

From 16. oil shale symposium; Golden, CO, USA (13 Apr 1983).

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Experiments were conducted to evaluate two technologies to control groundwater pollution due to leaching of abandoned modified in-situ (MIS) retorts, retort grouting and international leaching. Retort grouting to reduce permeability was evaluated by measuring the permeability of grouts containing only raw or refined waste materials (Lurgi spent shale, fly ash, gypsum tailings, and lignosulfonate fluidizers). Permeability of the cured grouts decreased with increasing confining pressure. Electrical conductivity measurements on the permeate produced during permeability measurements suggest that grouting abandoned MIS retorts would increase the TDS of leachate by a factor of approximately 3; benefit of the proposed grouting operation would depend upon the flow rate through retorts being reduced by a greater factor to reduce the total mass (concentration x flow) of solute released. Costs for international leaching depend primarily upon the volume of leachate to be treated. The required number of pore volumes of leaching to reduce leachate concentration to 10% of its initial value was found to be 2.1 at tract C-a and 3.4 at tract C-b; the difference is due primarily to the greater void volume used at tract C-a (40% compared to 23%). Both technologies would require a large amount of water. Retort grouting requires water to prewet the MIS spent shale and to prepare the grout. These requirements were estimated at 140 to 210 gal/bbl of oil, considering only oil recovered by in-situ retorting. International leaching requires water to saturate the MIS spent shale and to replace blowdown or rejected brine from the leachate treatment process. These requirements were estimated at approximately 120 gal/bbl of oil.

48619 **(PB—83-200121) Pollution control technical manual: modified 'in situ' oil shale retorting combined with Lurgi surface retorting. Final report.** (Denver Research Inst., CO (USA)). Apr 1983. 429p. NTIS, PC A19/MF A01.

The oil shale PCTM for Modified In Situ Oil Shale Retorting combined with Lurgi Surface Retorting addresses the application of this combination of technologies to the development of oil shale resources in the western United States. This manual describes the combined plant using Lurgi surface retorting technology (developed by Lurgi Kohle and Mineralotechnik GmbH, West Germany) and the Modified In Situ process (developed by Occidental Oil Shale, Inc.) proposed by Occidental Oil Shale, Inc. and Tenneco Shale Oil Company for use in the development of their Federal oil shale lease Tract C-b in western Colorado. Since details regarding waste streams and control technologies for the Lurgi process are presented in a separate PCTM, this document focuses principally on the Modified In Situ process.

48620 **(PB—83-200212) Pollution control technical manual: TOSCO 2 oil shale retorting with underground mining. Final report.** (Denver Research Inst., CO (USA)). Apr 1983. 433p. NTIS, PC A19/MF A01.

This manual proceeds through a description of the TOSCO II oil shale plant proposed by Colony Development Operation, characterizes the waste streams produced in each medium, and discusses the array of commercially available controls which can be applied to the TOSCO II plant waste streams. From these generally characterized controls, several are examined in more detail for each medium in order to illustrate typical control technology operation. Control technology cost and performance estimates are presented, together with descriptions of the discharge streams, secondary waste streams and energy requirements. A summary of data limitations and needs for environmental and control technology considerations is presented.

0410 Enviromental Aspects

REFER ALSO TO CITATION(S) 48619, 48620

48621 **(PB—83-200204) Pollution control technical manual: Lurgi oil shale retorting with open pit mining. Final report.** (Denver Research Inst., CO (USA); Environmental Protection Agency, Cincinnati, OH (USA). Industrial Environmental Research Lab.). Apr 1983. 363p. NTIS, PC A16/MF A01.

The Lurgi oil shale PCTM addresses the Lurgi retorting technology, developed by Lurgi Kohle and Mineralotechnik GmbH, West Germany, in the manner in which this technology may be applied to the oil shales of the western United States. This manual proceeds through a description of the Lurgi oil shale plant proposed by Rio Blanco Oil Shale Company, characterizes the waste streams produced in each medium, and discusses the array of commercially available controls which can be applied to the Lurgi plant waste streams. From these generally characterized controls, several are examined in more detail for each medium in order to illustrate typical control technology operation. Control technology cost and performance estimates are presented, together with descriptions of the discharge streams, secondary waste streams and energy requirements. A summary of data limitations and needs for environmental and control technology considerations is presented.

48622 **(PB—83-216374) Development of a slurry filling system for modified in situ oil shale mining. Open file report 28 Sep 79-30 Jun 82.** Ziemba, E.A.; Watson, G.H.; Bissery, P.H.; Namy, D.L.; Pfister, P. (Rio Blanco Oil Shale Co., Aurora, CO (USA); Soletanehe and Rodio, Inc., McLean, VA (USA); Bureau of Mines, Washington, DC (USA)). Mar 1982. 191p. NTIS, PC A09/MF A01.

The modified in-situ process is one of the methods being considered for extracting oil from oil shale. One of the questions to be answered for this approach is the environmental consequence of underground retort abandonment. This report outlines a study which addresses the question in terms of a grouting solution. It covers the development of a spent shale ash based grout which will fulfill the environmental requirements in terms of strength, stability, and impermeability. In addition, it will allow the reinjection of up to 50 percent of material mined and surface retorted as part of this process.

05 NUCLEAR FUELS

0502 Exploration

48623 (IA—1375, pp 217-218) **Aerial radiometric reconnaissance survey over Israel.** Aviv, R. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

48624 (IA—1375, pp 219-220) **Radiometric airborne system calibration.** Aviv, R.; Vulcan, U. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

48625 Status of a pulsed-neutron logging probe using a high-purity germanium detector. Jensen, D.H.; Barnard, R.W.; Bivens, H.M.; Humphreys, D.R.; Stephenson, W.A.; Weinlein, J.H. (Sandia National Lab, Albuquerque, NM 87185). *IEEE (Institute of Electrical and Electronics Engineers) Transactions on Nuclear Science;* **30**: No. 2, 1657-1663(Apr 1983).

In 1979 Sandia began the development of a logging tool to identify elements contained in minerals often associated with the deposition of uranium. This tool, a multi-element logging probe containing a high-purity germanium detector, may be used in two modes; passive -- which detects the gamma rays emitted from natural radionuclides in a formation, and active -- which uses a pulsed neutron generator to irradiate the rock formation surrounding a borehole and detects the gamma rays generated from interactions with nuclei in the formation. A solid copper cylinder in the probe is cooled to 90K with liquid nitrogen prior to logging and is used to maintain the temperature of the detector within its operating range while the probe is in the borehole. As the initial depth requirements of the logging tool were not great, an external coaxial cable was used in parallel with the standard logging cable to transmit the analog data to the surface for analysis. This approach allowed the authors to quickly evaluate the operation of the probe in the field and to begin our analysis of the spectra for elemental identification. A previous paper described the original design goals for the multi-element logging probe. In this paper the authors briefly review the probe design and describe some of the operational experiences and analytical results of field logging work with the probe.

0503 Mining

48626 (MESA-IR—1001) Mine engineering and ventilation problems unique to the control of radon daughters. Rock, R.L. (Mining Enforcement and Safety Administration, Denver, CO (USA). Denver Technical Support Center). 1974. 13p. NTIS, PC A02/MF A01. Order Number DE83902980.

Control of radon daughters in radioactive mines is sometimes considered to be basically a ventilation problem. The problem is, however, of such a nature that control over the amount of contamination released into the mine environment plus control over the manner in which that contamination is removed from the mine environment relative to occupied mine areas are of major importance in determining the difficulty of ventilation. In many respects, radon-daughter control involves different considerations than are involved in more conventional mine contaminants. One reason this is true is because of the rapid growth of the hazard (radon daughters) following contamination of the air with the parent radon. Another reason is that so few atoms of radon emanating from so many different sources can be involved in total mine contamination difficulties. Having worked on ventilation problems involving dust, blasting gases, diesel exhaust gases, and methane, the author can state that solutions to high radon-daughter concentrations often require more finesse than the aforementioned problems. The best method for providing practical solutions to radon-daughter control difficulties is to first make a detailed assessment of contamination sources relative to existing air distribution. Detection of subtle contamination causes may require highly trained personnel using specialized equipment. Usually the mine must be considered in its entirety during the contamination assessment program. Answers sought are: where and why major contamination problems are occurring; how beneficial changes may be affected without causing harmful effects in other active mine areas; and what major changes, such as increased primary airflow, are necessary to assure long-range environmental control over radon-daughter concentrations.

48627 (PB—83-205534) Investigation of microbially induced permeability loss during in-situ leaching. Contract research report 23 feb 81-15 jul 82. Brierley, C.L.; Brierley, J.A. (New Mexico Inst. of Mining and Technology, Socorro (USA)). 16 Apr 1982. 70p. NTIS, PC A04/MF A01.

Accumulations of microorganisms in the in situ leaching environment are believed responsible for plugging of the orebody and thus decreasing uranium extraction. To assess the contribution of microbial growth to this problem, packed columns of ore and core specimens were leached in the laboratory. Samples collected at four in situ uranium mining operations revealed pseudomonads, Xanthomonads, Bacillus sp. and Micrococcus sp. These microorganisms, inoculated into simulated leaching conditions, decreased permeability in two uranium ores by one order of magnitude in 20 days. Hydrogen peroxide alleviated microbial plugging in the laboratory. Periodic injection of hydrogen peroxide through the production well into the orebody may reduce microbial plugging problems in the field.

0504 Feed Processing

48628 (CONF-830788—2) Uranium from phosphate ores. Hurst, F.J. (Oak Ridge National Lab., TN (USA)). 1983. Contract W-7405-ENG-26. 21p. NTIS, PC A02/MF A01. Order Number DE83015731.

From Nuclear fuel cycle information workshop; Oak Ridge, TN, USA (12 Jul 1983).

The following topics are described briefly: the way phosphate fertilizers are made; how uranium is recovered in the phosphate industry; and how to detect covert uranium recovery operations in a phsophate plant.

0505 Enrichment

48629 (DOE/ET/33067—T1) Advanced-laser development for isotope separation. Final report. (Mathematical Sciences Northwest, Inc., Bellevue, WA (USA)). Jun 1983. Contract AC06-80ET33067. 115p. NTIS, PC A06/MF A01. Order Number DE83016151.

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To address a number of the issues associated with lasers appropriate for both atomic vapor and molecular laser enrichment schemes, MSNW developed pertinent technologies on two test devices. These were a high pulse rate, 100 watt excimer laser named Mistral, and a 20 watt copper-vapor laser (CVL). Mistral is a closed-loop, 100 W, kilohertz rare-gas halide laser system. The first half of the Mistral effort dealt with the study of gas flow and acoustic effects in high PRF rare-gas halide lasers. In burst-mode operation, 1250 Hz operation was demonstrated, the effects on flow quality of acoustic dampers were measured, and gas clearing factors of 2.5 at 1 kHz were demonstrated. The second half of the Mistral program dealt with extending the run time capability of the laser. This effort culminated with the continuous operation of Mistral for almost eight hours at 500 ppS, producing over 50 mJ/pulse at 308 nm on a single fill of XeCl gas mixture. At the end of the program, the effectiveness of using magnetic pulse compression in the modulator circuit of a copper-vapor laser (CVL) was also verified. The magnetic switching/pulse compression scheme as used on both the CVL and Mistral greatly extends thyratron lifetime.

0506 By-products

REFER ALSO TO CITATION(S) 48758, 48759, 48760

48630 The U.S. Department of Energy by-product utilization program. Remini, W.C.; Frankhauser, A. (U.S. Department of Energy, Washington, DC 20545). *Transactions of the American Nuclear Society;* **43**: 88(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48631 Recovery of noble metals from fission products. Jensen, G.A.; Bjorklund, W.J.; Mellinger, G.B.; Platt, A.M. (Battelle-Pacific Northwest Laboratory, P.O. Box 999, Richland, WA 99352). *Transactions of the American Nuclear Society;* **43**: 90-91(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48632 **Technetium - the corrosion inhibitor.** Bruns, L.E. (Rockwell Hanford Operations, P.O. Box 800, Richland, WA 99352). *Transactions of the American Nuclear Society;* **43**: 93-94(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

0507 Fuels Production And Properties

REFER ALSO TO CITATION(S) 48746, 48976, 48983, 49025, 49042

48633 **Method for producing nuclear fuel.** Haas, P.A. (to Dept. of Energy). US Patent 4,382,885. 10 May 1983. Filed date 24 Apr 1981. vp.

PAT-APPL-257014.

Nuclear fuel is made by contacting an aqueous solution containing an actinide salt with an aqueous solution containing ammonium hydroxide, ammonium oxalate, or oxalic acid in an amount that will react with a fraction of the actinide salt to form a precipitate consisting of the hydroxide or oxalate of the actinide. A slurry consisting of the precipitate and solution containing the unreacted actinide salt is formed into drops which are gelled, calcined, and pressed to form pellets.

48634 **Particle-size distribution in capacitor discharge vaporization of uranium dioxide.** Chen, K.; Erdman, C.A.; Kennedy, M.F.; Reynolds, A.B. (University of Virginia, Reactor Facility, Charlottesville, Virginia 22901). *Nuclear Science and Engineering;* **83**: No. 4, 459-472(Apr 1983).

A homogeneous nucleation-condensation growth model was developed for calculating particle-size distributions measured in capacitor discharge vaporization (CDV) experiments conducted at the Oak Ridge National Laboratory. Uranium dioxide pellets were partially vaporized in an argon environment by rapid energy deposition through capacitor discharge. This was followed by rapid expansion and subsequent condensation of the UO_2 vapor. Measured primary particle-size distributions of the resulting aerosols were lognormal, with a geometric mean particle diameter of (0.014 + or - 0.002) μm and a geometric standard deviation of 1.7 + or - 0.1. It was postulated that the expanding UO_2 vapor compressed the surrounding argon as in a spherical shock tube and that the aerosol was generated by homogeneous nucleation and condensation growth in the resulting rarefaction wave. The calculated motion of the UO_2-argon interface is in approximate agreement with the movies of the expansion process. The calculated particle-size distributions are in agreement with the measured distributions except at the large particle end. This agreement indicates that the small primary particles from the CDV tests resulted from homogeneous nucleation and condensation growth, as assumed in the analytical model.

48635 **Production of spherical UO_2-UC_2 for nuclear fuel applications using thermochemical principles.** Stinton, D.P.; Lackey, W.J.; Spence, R.D. (Oak Ridge National Laboratory, Oak Ridge, Tennessee 37830). *Journal of the American Ceramic Society;* **65**: No. 7, 321-324(Jul 1982). Contract W-7405-ENG-26.

A process was developed for the production of high-density UO_2-UC_2 microspheres for use as fuel in HTGRs. This process applied thermochemical principles so that reaction and sintering could occur at the unusually low temperature of 1550°C and neartheoretical densities could still be obtained. Temperatures previously used for carbothermic conversion are several hundred degrees higher.[13] Reaction and sintering took place in two steps. The first was sintering in Ar-1% CO at 1550°C for 4 h. which produced highly dense microspheres containing UO_2 and UC /SUB x/ O /SUB y/. The second required sintering in Ar-3% CO at 1550°C for an additional 4 h to shift the thermodynamic equilibrium from UO_2 and UC / SUB x/ O /SUB y/ to UO_2 and UC_2. The highly dense structure was retained, while carbon from the carbon monoxide atmosphere reacted with UC /SUB x/ O /SUB y/ to form UO_2 and UC_2.

48636 **Fissile fuel production by linear accelerators.** Takahashi, H.; Grand, P.; Kouts, H.J.C.; Powell, J.R.; Steinberg, M. (Brookhaven National Laboratory, Upton, NY 11973). *Transactions of the American Nuclear Society;* **43**: 138-140(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48637 **U_3O_8 from resin for powder metallurgy fabrication of reactor fuel.** Mosley, W.C. (E. I. du Pont de Nemours & Company, Savannah River Laboratory, Aiken, SC 29808). *Transactions of the American Nuclear Society;* **43**: 166(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

0508 Spent Fuels Reprocessing

REFER ALSO TO CITATION(S) 48748, 49558

48638 **(AGNS—35900-CONF-180) Diluent degradation products in the Purex solvent.** Neace, J.C. (Allied-General Nuclear Services, Barnwell, SC (USA)). Aug 1983. Contract AC09-78ET35900. 14p. (CONF-830633—5). NTIS, PC A02/MF A01. Order Number DE83016381.

From 3. symposium on separation science and technology for energy applications; Gatlinburg, TN, USA (27 Jun 1983).

A number of laboratory tests were conducted in which various impurities, known to be present in degraded Purex solvent, were injected into fresh solvent samples and the effects of these impurities tested in an operating miniature pulse column and in batch contactors. Common fission product elements which interfere in the Purex process were spiked with radiotracers and added to the aqueous phase samples with which the test solvents were contacted. Process controls and blanks were used to verify test data. Periodically, samples of the organic phase were withdrawn for analyses by radiochemical means. From the data obtained, a number of theories were postulated on the mechanisms by which diluent degradation products interfere in the Purex process.

48639 **(CONF-830788—1) Nuclear fuel reprocessing.** North, E.D. (Oak Ridge National Lab., TN (USA)). 1983. Contract W-7405-ENG-26. 16p. NTIS, PC A02/MF A01. Order Number DE83015501.

From Nuclear fuel cycle information workshop; Oak Ridge, TN, USA (12 Jul 1983).

48640 **(DP—1666) Dissolution of plutonium metal in HNO_3-N_2H_4-KF.** Karraker, D.G. (Du Pont de Nemours (E.I.) and Co., Aiken, SC (USA). Savannah River Lab.). Jul 1983. Contract AC09-76SR00001. 22p. NTIS, PC A02/MF A01. Order Number DE83016115.

Plutonium metal dissolves in HNO_3-N_2H_4.HNO_3-KF solution to yield a Pu^{3+} solution without an accompanying precipitation of plutonium oxide solids. The reaction evolves less than 0.2 mole of gas per mole of plutonium dissolved; the gas contains only 3% H_2. About 10^{-3} moles of HN_3 are produced per mole of plutonium dissolved. Optimum conditions for dissolving both alpha-phase and delta-phase plutonium metal were developed. Possible applications are to the recovery of plutonium metal or the processing of irradiated plutonium metal and alloys.

48641 **(DP-MS—83-35) Chloride removal from plutonium alloy.** Holcomb, H.P. (Du Pont de Nemours (E.I.) and Co., Aiken, SC (USA). Savannah River Plant). 1983. Contract AC09-76SR00001. 23p. (CONF-8306108—1). NTIS, PC A02/MF A01. Order Number DE83015413.

From 7. actinide separations workshop; Oak Ridge, TN, USA (23 Jun 1983).

SRP is evaluating a program to recover plutonium from a metallic alloy that will contain chloride salt impurities. Removal of chloride to sufficiently low levels to prevent damaging corrosion to canyon equipment is feasible as a head-end step following dissolution. Silver nitrate and mercurous nitrate were each successfully

used in laboratory tests to remove chloride from simulated alloy dissolver solution containing plutonium. Levels less than 10 ppM chloride were achieved in the supernates over the precipitated and centrifuged insoluble salts. Also, less than 0.05% loss of plutonium in the +3, +4, or +6 oxidation states was incurred via precipitate carrying. These results provide impetus for further study and development of a plant-scale process to recover plutonium from metal alloy at SRP.

48642 **(DPSP—83-1065) Solvent purification with high-porosity (macroreticular) ion-exchange resin.** McKibben, J.M. (Du Pont de Nemours (E.I.) and Co., Aiken, SC (USA). Savannah River Plant). [nd]. Contract AC09-76SR00001. 30p. NTIS, PC A02/MF A01. Order Number DE83016836.

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Numerous solvent degradation products exist in all of our process solvents that are not efficiently removed in the routine solvent washing operation. Tests indicate that a relatively new type of resin - variously called high-porosity, macroreticular, or macroporous resin - removes at least some of these persistent chemicals and substantially improves the quality of any TBP process solvent. A plant test is proposed for the purification of the first cycle solvent of the HM process, in which a loop will be installed to draw a small side stream of solvent from the washed solvent hold tank (904), pass it through a 2.7 ft^3 resin column, and return it to the same tank.

48643 **(PB—83-200436) Long-term storage of radioactive kryston in pressure vessels; safety.** Niephaus, D.; Nommensen, O.; Bruecher, H. (Commission of the European Communities, Luxembourg). [nd]. 151p. (EUR—7771-DE). NTIS, PC E08/MF E08.

The recommendations of the German Radiation Commission require the removal of the radioactive rare gas krypton-85(85Kr) from the dissolver off-gas of a LWR reprocessing plant. A feasible method for its removal is thought to be the long-term above-ground storage of the rare gas in pressure vessels. The aim of the study is the translation of this storage concept into practical terms and the assessment of its feasibility from the point of view of safety and cost.

48644 **Monte Carlo modeling of the neutronics of a lead slowing down time assay device.** Little, R.C.; Alam, B.; Block, R.C.; Fisher, H.M.; Harris, D.R.; Slovacek, R.E. (Los Alamos National Laboratory, P.O. Box 1663, Los Alamos, NM 87545). *Transactions of the American Nuclear Society;* **43**: 119-121(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

0509 Transport And Storage

REFER ALSO TO CITATION(S) 48643

48645 **(CONF-830788—5) Transportation of radioactive materials.** Shappert, L.B. (Oak Ridge National Lab., TN (USA)). 1983. Contract W-7405-ENG-26. 21p. NTIS, PC A02/MF A01. Order Number DE83015502.

From Nuclear fuel cycle information workshop; Oak Ridge, TN, USA (12 Jul 1983).

Visual aid materials are presented for: shielding requirements; heat output; fuel cycle; types of packages used; shipping container for carrying fissile material; disposable container for liquid shipments; containment;transportation accidents.

48646 **(SAND—83-0867) Preliminary analysis of the cost and risk of transporting nuclear waste to potential candidate commercial repository sites.** Wilmot, E.L.; Madsen, M.M.; Cashwell, J.W.; Joy, D.S. (Sandia National Labs., Albuquerque, NM (USA); Oak Ridge National Lab., TN (USA)). Jun 1983. Contract AC04-76DP00789. 59p. NTIS, PC A04/MF A01. Order Number DE83016348.

This report documents preliminary cost and risk analyses that were performed in support of the Nuclear Waste Terminal Storage (NWTS) program. The analyses compare the costs and hazards of transporting wastes to each of five regions that contain potential candidate nuclear waste repository sites being considered by the NWTS program. These regions are: the Gulf Interior Region, the Permian Basin, the Paradox Basin, Yucca Mountain, and Hanford. Two fuel-cycle scenarios were analyzed: once-through and reprocessing. Transportation was assumed to be either entirely by truck or entirely by rail for each of the scenarios. The results from the risk analyses include those attributable to nonradiological causes and those attributable to the radioactive character of the wastes being transported. 17 references.

48647 **(SAND—83-1068C) Preliminary assessment of nuclear waste transportation cost and risk for operation of the first repository at candidate sites.** Peterson, R.W.; McSweeney, T.I.; Varadarajan, R.V.; Wilmot, E.L.; Cashwell, J.W.; Joy, D.S. (Sandia National Labs., Albuquerque, NM (USA); Battelle Memorial Inst., Columbus, OH (USA); Oak Ridge National Lab., TN (USA)). 1983. Contract AC04-76DP00789. 10p. (CONF-830528—54). NTIS, PC A02/MF A01. Order Number DE83016760.

From 7. international symposium on packaging and transportation of radioactive materials; New Orleans, LA, USA (15 May 1983).

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To support the selection of the first commercial nuclear waste repository site in 1987, environmental analyses of five candidate site locations are currently being performed. The five locations are in the Gulf Interior Region, the Permian Basin, the Paradox Basin, Yucca Mountain and the Hanford reservation. Costs and operational risks associated with the transportation of nuclear wastes to a single repository located in these regions have been calculated for a life-cycle of 26 years.

48648 **Projection of U.S. LWR spent fuel storage requirements.** Fletcher, J.F.; Cole, B.M.; Rau, R.G. (Battelle-Pacific Northwest Laboratory, P.O. Box 999, Richland, WA 99352). *Transactions of the American Nuclear Society;* **43**: 136-137(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48649 **Centralized storage of spent fuel elements in France - construction and operation experience and new trends.** Chometon, P.E.; Ricaud, J.L. (SGN, 78184 Saint-Quentin-Yvelines, Cedex). *Transactions of the American Nuclear Society;* **43**: 137(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48650 **Radiological impacts of cladding and containment failures in at-reactor dry storage facilities.** Elias, E.; Johnson, C.B.; Lambert, R.W. (S. Levy Inc., 1999 S. Bascom Avenue, Suite 725, Campbell, CA 95008). *Transactions of the American Nuclear Society;* **43**: 116-117(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48651 **Adaptation of the MODREX spent fuel storage system to European licensing requirements.** Doroszlai, P.G.K.; Baxter, B. (Electrowatt Engineering Services Ltd., 8022 Zurich). *Transactions of the American Nuclear Society;* **43**: 117-118(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48652 **Experimental investigation and analytical correlation of the Dyna-Canister dynamic absorber.** Wachter, W.J.; Lam, P.C.; Scavusso, R.J. (U.S. Tool & Die, Inc., 4030 Route 8, Allison Park, PA 15101). *Transactions of the American Nuclear Society;* **43**: 118-119(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48653 **Dose rate measurement of research reactor fuel.** Benneche, P.E.; Williamson, T.G. (University of Virginia, Charlottesville, VA 22901). *Transactions of the American Nuclear Society;* 43: 121-122(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48654 **(RISLEY-Trans—4709) Transport of radioactive materials within the nuclear fuel cycle.** Heuse, E.; Wienhold, W. (Gesellschaft fuer Reaktorsicherheit m.b.H. (GRS), Koeln (Germany, F.R.)). Nov 1981. Translation of GRS-S-37. 84p. NTIS (US Sales Only), PC A05/MF A01. Order Number DE83902926.

In the first instance, a description is presented of the movements of material between the various stations within the nuclear fuel cycle. The intention in so doing was to present the reader with a realistic picture of the materials conveyed and the means whereby they are conveyed, and also of the routes along which the shipments progress, before he is confronted with the important but nevertheless dry and complex legal aspects. For the purposes of this report, this legal matter can be divided into aspects covered by the Atomic Law of the Federal Republic and aspects covered by traffic statutes, adopting a rough classification, and each side can be considered separately. The statutory traffic regulations form the basis for the design requirements which must be satisfied by the packaging systems utilized for radioactive materials, in order that shipping approval may also be granted under the Atomic Law. The regulations can be seen to be reflected in the very wide variety of designs produced for the shipping containers. The question of which mode of transport - rail, road, water or air - is to be utilized for the shipment of packages containing radioactive materials must be decided, as is explained, by applying specific selection criteria in which account is taken, among other things, of safety measures for the prevention of accidents and their consequences and also aspects relating to the safeguarding of shipments. It is explained that technology and man must be made to work together under the safety concept in a coordinated manner, but that safety in the absolute sense is unattainable and residual risks remain. As regards these residual risks, mention is made of special equipment and emergency services.

0510 Marketing And Economics

REFER ALSO TO CITATION(S) 48956

48655 (EPRI-EA—3015, pp 9.1-9.37) **Comparison of two uranium-market forecasting models.** Bleistein, S.; (Denver Research Inst., CO); Recek, J. May 1983. NTIS, PC A12/MF A01. (CONF-811285—Exc.).

From EPRI fuel supply seminar; Memphis, TN, USA (8 Dec 1981).

The techniques and methodologies, similarities and differences, and the results of two uranium market computer models - the Uranium Supply Analysis System and the EUREKA model - are surveyed. These models can be of use to electric utilities in developing procurement strategies or planning new reactor requirements. The models are designed to simulate actual market performance of the domestic uranium industry under varying user-specified assumptions. These models provide output in the form of projections of variables of interest, such as investment in exploration and new production capacity, additions to reserves and resources, and adjustments in inventories. Comparison between the models is demonstrative of how output can vary even with use of the same input data. Utilities may profit by the comparison with respect to the task of selecting models on the basis of obtaining the most-useful solution for a given problem. 18 figures.

48656 (EPRI-EA—3015, pp 10.1-10.20) **Market stresses and readjustment: politics and pragmatism in the international uranium market.** Neff, T.L. (Massachusetts Inst. of Tech., Cambridge). May 1983. NTIS, PC A12/MF A01. (CONF-811285—Exc.).

From EPRI fuel supply seminar; Memphis, TN, USA (8 Dec 1981).

Historically, the United States uranium market was isolated from international markets; therefore, United States consumers had little incentive to look abroad. Later, the government imposed an embargo on imports of uranium for domestic use. The phase-out of the embargo and recent discovery of high-grade deposits in Australia and Western Canada, as well as large intermediate-cost deposits in Africa, assure that the United States market will be affected by international developments more than in the past. Projected uranium-consumer supply arrangements are compared with enrichment commitments to reactor requirements for several key countries. For all areas, both uranium supply and enrichment commitments exceed reactor needs until at least 1985. Inventory buildup will depend upon what adjustments are made. Uranium prices have never been set by market forces alone and governmental policies and political struggles may have a significant impact on price. 8 figures.

0520 Waste Management

REFER ALSO TO CITATION(S) 48630, 48631, 48632, 48735, 48736, 48737, 48738, 48741, 48742, 48743, 48748, 48757, 49121, 49122, 49123, 49525, 49602, 49858, 50039, 50088, 50089, 50449

48657 **(AEEW-R—1577) Incorporation of low and medium level radioactive wastes (solids and liquids) in cement. 3rd 6-monthly report January-June 1982.** Brown, D.J.; Capp, P.D.; Smith, D.L. (UKAEA Atomic Energy Establishment, Winfrith). Aug 1982. 15p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702437.

Laboratory studies and mixing plant trials on simulated radioactive waste formulations are reported. Long term stability testing of various formulations including those containing blast furnace slag-ordinary Portland cement, sodium nitrate, ion exchange resins, and sodium nitrate-tributyl phosphate, are reported and some results are given. Mixing plant trials with a high shear cement mixer are reported. An outline of future work is presented.

48658 **(DOE/LLW—13Td) Procedures and technology for shallow-land burial. Low-level radioactive-waste-management handbook series.** (Oak Ridge National Lab., TN (USA)). Aug 1983. Contract W-7405-ENG-26. 200p. NTIS, PC A09/MF A01. Order Number DE83016520.

This handbook provides technical information on the requirements, activities, and the roles of all parties involved in the development and operation of new shallow land burial facilities for disposal of low-level radioactive waste. It presents an overview of site selection, design, construction, operation, and closure. Low-level waste shallow land burial practices and new technology applications are described. The handbook is intended to provide a basis for understanding the magnitude and complexity of developing new low-level waste disposal facilities.

48659 **(DOE/LLW—21T) Improved low-level radioactive waste management practices for hospitals and research institutions.** (EG and G Idaho, Inc., Idaho Falls (USA)). Jul 1983. Contract AC07-76ID01570. 94p. NTIS, PC A05/MF A01. Order Number DE83015465.

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This report provides a general overview and a compendium of source material on low-level radioactive waste management practices in the institutional sector. Institutional sector refers to hospitals, universities, clinics, and research facilities that use radioactive materials in scientific research and the practice of medicine, and the manufacturers of radiopharmaceuticals and radiography devices. This report provides information on effective waste management practices for institutional waste to state policymakers, regulatory agency officials, and waste generators. It is not intended to be a handbook for actual waste management, but rather a sourcebook of general information, as well as a survey of the more detailed analysis.

48660 **(EGG-WM—6324) Implementation plan for the TRU Waste-Sampling Program.** Clements, T.L. Jr. (EG and G Idaho, Inc., Idaho Falls (USA)). Jul 1983. Contract AC07-76ID01570. 32p. NTIS, PC A03/MF A01. Order Number DE83016865.

This implementation plan for the TRU Waste-Sampling Program delineates tasks to be conducted at the Idaho National Engineering Laboratory (INEL), Los Alamos National Laboratory, and the Rocky Flats Plant. Primary objectives of the Program are: (1) to provide information on gas generation in newly generated and stored TRU waste; (2) to evaluate the adequacy of venting/filtering devices for maintaining safe hydrogen levels in sealed waste drums; (3) to determine the adequacy of INEL's real-time radiography system as a nondestructive certification technique; and (4) to examine wastes for compliance with the Waste Isolation Pilot Plant waste acceptance criteria. Schedules and costs for two different levels of activity and funding are outlined - a full-effort program, and a limited-effort program that is consistent with anticipated funding levels.

48661 **(ENICO—1133) Airborne radionuclide waste-management reference document.** Brown, R.A.; Christian, J.D.; Thomas, T.R. (Exxon Nuclear Idaho Co., Inc., Idaho Falls (USA)). Jul 1983. Contract AC07-79ID01675. 361p. NTIS, PC A16/MF A01. Order Number DE83016450.

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This report provides the detailed data required to develop a strategy for airborne radioactive waste management by the Department of Energy (DOE). The airborne radioactive materials of primary concern are tritium (H-3), carbon-14 (C-14), krypton-85 (Kr-85), iodine-129 (I-129), and radioactive particulate matter. The introductory section of the report describes the nature and broad objectives of airborne waste management. The relationship of airborne waste management to other waste management programs is described. The scope of the strategy is defined by considering all potential sources of airborne radionuclides and technologies available for their management. Responsibilities of the regulatory agencies are discussed. Section 2 of this document deals primarily with projected inventories, potential releases, and dose commitments of the principal airborne wastes from the light water reactor (LWR) fuel cycle. In Section 3, dose commitments, technologies, costs, regulations, and waste management criteria are analyzed. Section 4 defines goals and objectives for airborne waste management. (DMC)

48662 (IA—1375, pp 249-251) **Horcyl-1. A FORTRAN program providing the design data of a nuclear level-gauge for a horizontal cylindrical storage vessel.** Pasi, M.; Even-Zohar, Y. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

48663 **(IDO—10054(82)) Radioactive waste management information, 1982 summary and record-to-date.** Cassidy, G.B. (EG and G Idaho, Inc., Idaho Falls (USA)). Jul 1983. Contract AC07-76ID01570. 69p. NTIS, PC A04/MF A01. Order Number DE83016864.

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This document summarizes radioactive waste data records for the Idaho National Engineering Laboratory (INEL) compiled since 1952. Kinds of information include volume, radioactivity, isotopic identity, origin, and decay status. The radioactive waste data presented was obtained from the INEL Radioactive Waste Management Information System (RWMIS). This report is updated annually to incorporate waste management data for the current year and reflects changes in previous annual reports. Changes are made to more accurately reflect the current status of waste operations at the INEL.

48664 **(IDO—10055(82)) Radioactive waste management information for 1982.** Cassidy, G.B. (EG and G Idaho, Inc., Idaho Falls (USA)). Jul 1983. Contract AC07-76ID01570. 289p. NTIS, PC A13/MF A01. Order Number DE83016863.

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The following reports have been developed from the Waste Management Information System and are included: INEL Year-to-Date Summary, Disposed or Stored; Radionuclide Decay Reports, 1-10 years; Radionuclides Disposed and Stored at INEL, Monthly and Year-to-Date; Waste Volume Reduction Facility Data; and Facility Waste Reports, Monthly and Year-to-Date. Additional Reports that are available from the system are: Monthly Summary Report, Disposed and Stored; INEL Radioactive Discharge Alert Report; Alert Report for Unidentified and Mixed Nuclides; Monthly and Year-to-Date Solid Radioactive Waste Containers Disposed at INEL; and Monthly and Year-to-Date Solid Radioactive Waste Containers Stored at INEL.

48665 **(INIS-mf—8101) Radioactive waste management.** Rousseau, L. (CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Dept. de Surete Nucleaire). (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 55p. (CONF-8009308—47). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702816.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

In the present paper the following points are analyzed: - schematic diagrams for the analysis of release through barrier, - effluent sources localisation, - activities in various fluids of the facility, - prediction release activities balance, - reactor operating experience, - related risks.

48666 **(JAERI-M—82-007) Corrosion resistance of metal materials for HLW canister.** Furuya, T.; Muraoka, S.; Tashiro, S. (Japan Atomic Energy Research Inst., Tokyo). Feb 1982. 35p. (In Japanese). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702436.

In order to verify the materials as an important artificial barrier for canister of vitrified high-level waste from spent fuel reprocessing, data and reports were researched on corrosion resistance of the materials under conditions from glass form production to final disposal. Then, in this report, investigated subjects, improvement methods and future subjects are reviewed. It has become clear that there would be no problem on the inside and outside corrosion of the canister during glass production, but long term corrosion and radiation effect tests and the vitrification methods would be subjects in future on interim storage and final disposal conditions.

48667 **(JAERI-M—82-024) Operational experience of low active β-γ solid waste treatment system at OARAI.** Sato, M.; Anzai, S.; Tamura, M.; Tadokoro, N.; Iwamoto, S.; Mito, N. (Japan Atomic Energy Research Inst., Tokyo). Mar 1982. 37p. (In Japanese). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702438.

Low active β-γ solid waste treatment system II was installed at Oarai in order to improve the radioactive solid wastes stream, especially to reduce the number of waste packages. The system II is composed of a bailing machine and pre-treatment machines in a gloved box, e.g. a filter crusher, dehydrater and hoists. The function of each machine is as follows; 1) Bailing machine; compression of metal waste and other compressible (non combustible) wastes. 2) Filter crusher; separation of wooden frame from HEPA filter and cutting of wooden frame prior to incineration, 3) Dehydrater; dehydration of wet rags prior to incineration. From the last two years operation, the following improvements have been made: 1) The number of packages from metal waste reduced to a quarter, 2) The number of packages from HEPA filter reduced to a quarter, 3) Wets rags can be burnt rather easily after dehydration, 4) Many packages have become more stable in both chemical and physical properties, 5) The total number of packages from low active β-γ solid wastes has decreased to 70% with combination of the incinerator.

48668 **(JAERI-M—9910) Construction and operation of the vapor compression evaporator radioactive waste treatment facility.** Nishizawa, Ichio; Sakamoto, Tsutomu; Katsuyama, Kazuo; Shinji, Yoshimasa; Mito, Norio; Matsumoto, Akira. (Japan Atomic Energy Research Inst., Tokyo). Jan 1982. 41p. (In Japanese). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83701471.

The vapor compression evaporator plant with a capacity of 3 m^3/hr was installed at the Japan Atomic Energy Research Institute, Oarai Establishment in March of 1978. After completion, in order to ascertain both the characteristics inherent in the plant and the optimum operating condition, a series of tests were conducted using both non-radioactive liquid and a radioactive solution which

was prepared for these purposes. As a final step we ran the facility to gain experience in the operation and maintenance of the plant using real liquid radioactive waste. The items ascertained through conducting these tests, the operation and maintenance of the facility were as follows; (1) the designed treatment capacity of 3 m^3/hr was attained; (2) the controlability of the plant was satisfactory down to the half capacity (1.5 m^3/hr); (3) the decontamination factor was greater than 10^4; (4) the evaporation factor which has strong bearings on the operating cost was 14 times as high as a common single-effect evaporator, therfore, only one-fourteenth the energy is needed as a heat source to run the plant; (5) scales on the heat transferring region could be entirely removed with a chemical agent; and (6) after having processed actual radioactive liquid waste of 3,000 m^3, only one main component of the plant showed any sign of deterioration. The results obtained showed that the vapor multi-effect compression evaporator is one of the most promising ways for radioactive liquid waste treatment.

48669 **(LA—9577-PR) Research and development related to the Nevada Nuclear Waste Storage Investigations. Progress report, July 1-September 30, 1982.** Daniels, W.R.; Erdal, B.R.; Vaniman, D.T. (comps.). (Los Alamos National Lab., NM (USA)). Mar 1983. Contract W-7405-ENG-36. 76p. NTIS, PC A05/MF A01. Order Number DE83016352.

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This report summarizes the contribution of the Los Alamos National Laboratory to the Nevada Nuclear Waste Storage Investigations for the fourth quarter of FY 1982. Progress reports are presented for the following: (1) field experiments; (2) geochemistry of tuff; (3) mineralogy-petrology of tuff; (4) volcanism studies; (5) shaft and borehole sealing; (6) rock physics studies; (7) exploratory shaft; and (8) quality assurance.

48670 **(LA-UR—83-1931) Multi-isotopic gamma-ray assay system for alpha-contaminated waste.** Close, D.A.; Pratt, J.C.; Caldwell, J.T.; Kunz, W.E.; Schultz, F.J.; Haff, K.W. (Los Alamos National Lab., NM (USA); Oak Ridge National Lab., TN (USA)). 1983. Contract W-7405-ENG-36. 6p. (CONF-830709—26). NTIS, PC A02/MF A01. Order Number DE83015254.

From 24. annual meeting of the Institute of Nuclear Materials Management; Vail, CO, USA (10 Jul 1983).

The capability of an existing segmented gamma-ray system is being expanded for the analysis of alpha-contaminated waste drums. A cursory assay of 114 transuranic waste drums of 208-l capacity has been made. Analysis of these data indicates a detection limit better than 100 nCi/g of waste for $^{237}Np/^{233}Pa$, ^{239}Pu, ^{241}Am, $^{243}Am/^{239}Np$, ^{60}Co, ^{125}Sb, $^{134,137}Cs$, and ^{154}Eu. A pending Code of Federal Regulation (10CFR61) stipulates that the nuclear industry quantify not only its transuranic waste, but also certain beta- and gamma-ray-emitting fission products. An assay system based on gamma-ray spectroscopy is the only system that can meet this requirement for the fission products.

48671 **(NUREG/CR—3111-Vol.1) Assessment of the proposed rule (10CFR60) for disposal of high-level radioactive wastes in geologic repositories. Volume I.** Chu, M.S.; Ortiz, N.R.; Wahi, K.K.; Pepping, R.E.; Campbell, J.E. (Sandia National Labs., Albuquerque, NM (USA)). Jun 1983. Contract AC04-76DP00789. 188p. (SAND—82-2969-Vol.1). NTIS, PC A09/MF A01 - GPO. Order Number DE83016862.

This report summarizes the work performed for the Nuclear Regulatory Commission (NRC) to assess its proposed Rule (10CFR60) for disposal of high-level radioactive wastes in geologic repositories. The objectives of this project were to provide information that NRC could use to evaluate the rationale for the technical requirements in the Rule, to respond to public comments on the proposed Rule, and to analyze the benefits of alternative criteria for the final rule. Three of the numerical criteria of the Performance Objectives of the Rule were analyzed in detail in this study. The three criteria pertain to: a containment period, a controlled release rate, and a pre-waste emplacement ground-water travel time. The Rule requires geologic repositories to comply with the draft EPA Standard (40CFR191); accordingly, this study assesses the relevance of the three numerical criteria to the draft EPA Standard. A series of parametric analyses were performed on the potential releases of radionuclides to the accessible environment in order to determine the impact of the three criteria on compliance with the draft EPA Standard. The analyses were performed for three geologic media: basalt, bedded salt, and tuff. The study also examined the achievability of the three numerical criteria based on an assessment of the existing technology. Parameters and techniques that could be used to assess compliance were identified. In addition to the three numerical criteria, certain other requirements were also addressed in varying degrees of detail. The structure and content of the Rule were analyzed for completeness, consistency, and redundancy. As part of this study, a panel of experts was formed to address and debate the issues relating to the requirements contained in the proposed Rule. A number of recommendations have been made in the report based on the analyses performed and the outcome of the panel discussions.

48672 **(NUREG/CR—3398) Numerical study of unsaturated flows and seepage of contaminants from subgrade mill tailings disposal areas equipped with bottom-clay liners.** Pin, F.G.; Witten, A.J.; Sharp, R.D.; Long, E.C. Jr. (Oak Ridge National Lab., TN (USA)). Aug 1983. Contract W-7405-ENG-26. 55p. (ORNL/TM—8822). NTIS, PC A04/MF A01 - GPO. Order Number DE83016430.

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A computer code (MIGRAT) is developed to quantify the migration of moisture and multiple decaying and retarded contaminants in the unsaturated zone. MIGRAT was specifically conceived to assess the impacts of open mine to allow its use in many problems related to shallow, subsurface waste disposal. The model is applied to a generic uranium-mill-tailings pit constructed with a clay-lined bottom and steep unlined sidewalls. The contaminant decays and only one contaminant is retarded. This study shows the anticipated result that moisture and contamination migrate slowly through the bottom clay liner and that, in this migration, concentrations of the retarded contaminant significantly lag the unretarded contaminant. More importantly, this study reveals that the major pathway from the pit to the groundwater is through the sidewall. The time scales for this pathway are much shorter than those associated with the clay liner, and retardation has little effect on the rate of contaminant migration.

48673 **(ONWI—139) Preliminary investigation of the thermal and structural influence of ventilation drifts on repository rooms.** Wagner, R.A. (RE/SPEC, Inc., Rapid City, SD (USA)). Jul 1983. Contract AC06-76RL01830;AC02-83CH10140. 33p. NTIS, PC A03/MF A01. Order Number DE83016917.

The presence of ventilation drifts within a design of a National Waste Terminal Storage (NWTS) repository in domal salt is investigated for the thermal and structural influence on the corridors and disposal rooms. The structural influence of the ventilation drifts is emphasized since the heat and fluid flow aspects (e.g., air flow rate, air temperature, and air pathways) are beyond the scope of this study. The two-dimensional numerical analyses considered two representative cross-sections of the design perturbation of approximately 10°C near the ventilation drift. The remaining portion of the repository should experience negligible temperature variation because of the physical presence of the ventilation drift. The mechanical results indicated a noticeable change in stress only near the region of the excavated ventilation drift. Additional room and corridor deformation due to the presence of the ventilation drift was small. The ventilation drifts considered in this study do not appear to have a significant thermal or structural influence beyond the immediate vicinity of the ventilation drift. Therefore, the corridors and disposal rooms should be unaffected by the presence of the ventilation drifts discussed herein.

48674 **(ONWI—490) Waste package materials testing for a salt repository: 1982 status report.** Kircher, J.F.; Moak, D.P.; Clark, D.E. (Battelle Memorial Inst., Columbus, OH (USA). Office of Nuclear Waste Isolation). Aug 1983. Contract AC06-76RL01830;AC02-83CH10140. 143p. NTIS, PC A07/MF A01. Order Number DE83016811.

The US plans to safely dispose of nuclear waste in deep, stable geologic formations. As part of these plans, the US Depart-

ment of Energy (DOE) is sponsoring research on the designing and testing of waste packages and waste package materials. This report summarizes recent results of waste package materials testing in a salt environment. The results from these tests will be used by waste package designers and performance assessment experts. Release characteristic data are available on two waste forms (spent fuel and waste embedded in glass) which were exposed to leaching tests at various radiation levels, temperatures, pH, volumes, and brine solution and oxygen concentrations simulating expected salt repository conditions. Candidate materials tested or soon to be tested for corrosion resistance and other properties include iron alloys; TiCode-12, the most promising titanium alloy for containment; nickel alloys; and stainless steel. Testing of fluid movement and thermal conductivity through various backfill mixtures shows that these materials can perform satisfactorily. In component interaction testing, no synergistic effects have ruled out any candidate material. 77 references, 37 figures, 30 tables.

49675 (PB—83-197731) Regulatory impact analysis of environmental standards for uranium mill tailings at active sites. Final report. (Office of Radiation Programs, Washington, DC (USA)). Mar 1983. 263p. (EPA—520/1-82-023). NTIS, PC A12/MF A01.

The Environmental Protection Agency was directed by Congress, under PL 95-604, the Uranium Mill Tailings Radiation Control Act of 1978, to set standards of general application that provide protection from the hazards associated with uranium mill tailings. Title I of the Act pertains to tailings at inactive sites for which the Agency has developed standards as part of a separate rulemaking. Title II of the Act requires standards covering the processing and disposal of byproduct materials at mills which are currently licensed by the appropriate regulatory authorities. This Regulatory Impact Analysis (RIA) addresses the standards developed under Title II. There are two major parts of the standards for active mills: standards for control of releases from tailings during processing operations and prior to final disposal, and standards for protection of the public after the disposal of tailings. This report presents a detailed analysis of standards for disposal only, since the analysis required for the operations standards is very limited.

49676 (PB—83-198903) Fabrication of highly active glasses using the cells VULCAIN and PIVER: leaching of certain of these glasses at three temperatures in the cell VULCAIN. Final report. Jacquet-Francillon, N.; Laude, F.; Magnier, A.; Vernaz, E. (Commission of the European Communities, Luxembourg). [nd]. 60p. (EUR—7371-FR). NTIS, PC A04/MF E04.

The methods for the fabrication and leaching of four types of glass of British, French and German origin and of a vitreous ceramic of German origin in the reaction vessels VULCAIN and PIVER are described, the starting materials being solutions of actual fission products (caesium, strontium, cerium, ruthenium) and a suspension of vitreous granules and nitric acid. The data obtained during leaching with industrial grade water in continuous flow and at ambient temperature at the end of 40 days, and in batch experiments with daily renewal of water at the two temperatures of 50C degrees and 70C degrees are shown in the form of tables and graphs.

49677 (PB—83-199778) Verfestigung alphahaltiger abfaelle in keramischer matrix Solidifying alpha-bearing wastes in a ceramic matrix. Final report. Kartes, H.; Riege, U.; Goertzen, A.; Dippel, T. (Commission of the European Communities, Luxembourg). [nd]. 91p. (EUR—7654-DE). NTIS, PC E05/MF E01.

The report summarises the results achieved with a laboratory scale process for solidifying alpha-bearing wastes in a ceramic matrix. Three steps are involved: (1) after neutralisation of the acid constituents, the wastes are converted into pastes by treatment with kaolin, feldspar and quartz, thus achieving homogeneous distribution of the solids and radioactive particles, (2) an extrudate, formed from the paste, is pelleted and sintered to form dense ceramic cylindrical bodies, in which plutonium has been converted to its oxide, and (3) a monolithic block is produced by embedding the ceramic bodies in a glass or metal matrix. The process was demonstrated using alpha-concentrates from UO2/PuO2 fuel element fabrication and ashes from alpha-containing wastes with a high plutonium content.

49678 (PB—83-204263) Evaluation of Enewetak radioactivity containment. Final report. (National Research Council, Washington, DC (USA). Committee on Evaluation of Enewetak Radioactivity Containment). Mar 1982. 53p. NTIS, PC A04/MF A01.

Between 1948 and 1958 the Enewetak Atoll in the Marshall Islands was the site of 43 nuclear explosions, part of the government's nuclear testing program. Responding to the demands of the Enewetak people, the government in 1972 decided to rehabilitate the atoll. In the cleanup process, radiologically contaminated soil and debris from many of the atoll's islands were placed in a massive, domed concrete containment structure built over one of the bomb craters on Runit Island. In order to provide the people of Enewetak and the Marshallese Government with an objective assessment of the containment structure's safety, the Defense Nuclear Agency asked the Advisory Board on the Built Environment of the National Research Council to study the matter. The committee appointed to conduct the study concentrated on two issues: (1) the potential hazard of transuranics being transported to the surrounding environment from the structure, and (2) the possible sequence of events that would affect the structure's physical integrity, and the radioactive hazards that would result from breachment of the dome.

49679 (PNL—4689) Status of radioiodine control for nuclear fuel reprocessing plants. Burger, L.L.; Scheele, R.D. (Pacific Northwest Lab., Richland, WA (USA)). Jul 1983. Contract AC06-76RL01830. 51p. NTIS, PC A04/MF A01. Order Number DE83016918.

This report summarizes the status of radioiodine control in a nuclear fuel reprocessing plant with respect to capture, fixation, and disposal. Where possible, we refer the reader to a number of survey documents which have been published in the last four years. We provide updates where necessary. Also discussed are factors which must be considered in developing criteria for iodine control. For capture from gas streams, silver mordenite and a silver nitrate impregnated silica (AC-6120) are considered state-of-the-art and are recommended. Three aqueous scrubbing processes have been demonstrated: Caustic scrubbing is simple but probably will not give an adequate iodine retention by itself. Mercurex (mercuric nitrate-nitric acid scrubbing) has a number of disadvantages including the use of toxic mercury. Iodox (hyperazeotropic nitric acid scrubbing) is effective but employs a very corrosive and hazardous material. Other technologies have been tested but require extensive development. The waste forms recommended for long-term storage or disposal are silver iodide, the iodates of barium, strontium, or calcium, and silver loaded sorbents, all fixed in cement. Copper iodide in bitumen (asphalt) is a possibility but requires testing. The selection of a specific form will be influenced by the capture process used.

49680 (PNL—4722) Allowable residual-contamination levels for decommissioning facilities in the 100 areas of the Hanford Site. Kennedy, W.E. Jr.; Napier, B.A. (Pacific Northwest Lab., Richland, WA (USA)). Jul 1983. Contract AC06-76RL01830. 133p. NTIS, PC A07/MF A01. Order Number DE83016642.

Portions are illegible in microfiche products. Original copy available until stock is exhausted.

This report contains the results of a study sponsored by UNC Nuclear Industries to determine Allowable Residual Contamination Levels (ARCL) for five generic categories of facilities in the 100 Areas of the Hanford Site. The purpose of this study is to provide ARCL data useful to UNC engineers in conducting safety and cost comparisons for decommissioning alternatives. The ARCL results are based on a scenario/exposure-pathway analysis and compliance with an annual dose limit for three specific modes of future use of the land and facilities. These modes of use are restricted, controlled, and unrestricted. The information on ARCL values for restricted and controlled use provided by this report is intended to permit a full consideration of decommissioning alternatives. ARCL results are presented both for surface contamination remaining in facilities (in dpm/100 cm^2), and for unconfined surface and confined subsurface soil conditions (in pCi/g). Two confined soil con-

ditions are considered: contamination at depths between 1 and 4 m, and contamination at depths greater than or equal to 5 m. A set of worksheets are presented in an appendix for modifying the ARCL values to accommodate changes in the radionuclide mixture or concentrations, to consider the impacts of radioactive decay, and to predict instrument responses. Finally, a comparison is made between the unrestricted release ARCL values for the 100 Area facilities and existing decommissioning and land disposal regulations. For surface contamination, the comparison shows good agreement. For soil contamination, the comparison shows good agreement if reasonable modification factors are applied to account for the differences in modeling soil contamination and licensed low-level waste.

48681 **(PNL-SA—9787) Status of radionuclide sorption-desorption studies performed by the WRIT program.** Serne, R.J.; Relyea, J.F. (Pacific Northwest Lab., Richland, WA (USA)). Jul 1981. Contract AC06-76RL01830. 86p. NTIS, PC A05/MF A01. Order Number DE83016176.

The most credible means for radionuclides disposed as solid wastes in deep-geologic repositories to reach the biosphere is through dissolution of the solid waste and subsequent radionuclide transport by circulating ground water. Thus licensing activities must consider the physicochemical interactions between radionuclides present in ground water with package components, rocks and sediments since these processes can significantly delay or constrain the mass transport of radionuclides in comparison to ground-water movement. This paper focused on interactions between dissolved radionuclides in ground water and rocks and sediments away from the near-field repository. The primary mechanism discussed is adsorption-desorption, which has been studied using two approaches. Empirical studies of adsorption-desorption rely on distribution coefficient measurements while mechanism studies strive to identify, differentiate and quantify the processes that control nuclide retardation. The status of sorption mechanism studies are discussed with emphasis on delineating the usefuleness of ideal ion exchange, site-binding electrical double-layer and redox controlled sorption constructs. Studies to date on the applicability of ideal ion exchange and site-binding electrical double-layer models for describing nuclide adsorption onto geologic media show greater potential for the latter construct. Future efforts will concentrate on evaluation site-binding electrical double-layer models. Laboratory studies are discussed which corroborate the importance of redox reactions in causing nuclide retardation for multivalenced elements such as Tc, Np, Pu and U. Results suggest both solution mediated reduction such as the Fe(II)-Fe(III) couple and solid/solution heterogeneous reduction reactions such as reduction of solution Pu(VI) at the mineral surface by structural Fe(II) occur.

48682 **(PNL-SA—10913) Waste glass/metal interactions in brines.** Shade, J.W.; Pederson, L.R.; McVay, G.L. (Pacific Northwest Lab., Richland, WA (USA)). May 1983. Contract AC06-76RL01830. 21p. (CONF-830451—22). NTIS, PC A02/MF A01. Order Number DE83016786.

From American Ceramic Society annual meeting; Chicago, IL, USA (25 Apr 1983).

Leaching studies of MCC 76-68 glass in synthetic brines high in NaCl were performed from 50 to 150°C and included interactive testing with ductile iron and titanium. Hydrolysis of the glass matrix was generally slower in saturated brines than in deionized water, due to a lower solubility of silica in the brines. Inclusion of ductile iron in the tests resulted in accelerated leach rates because irion-silica reactions occurred which reduced the silica saturation fraction. At 150°C, iron also accelerated the rate of crystalline reaction product formation which were primarily Fe-bearing sepiolite and talc. 16 references.

48683 **(PNL-SA—10976) Long-term leaching of two simulated waste glasses.** Lokken, R.O.; Strachan, D.M. (Pacific Northwest Lab., Richland, WA (USA)). Aug 1983. Contract AC06-76RL01830. 22p. (CONF-830451—21). NTIS, PC A02/MF A01. Order Number DE83016083.

From American Ceramic Society annual meeting; Chicago, IL, USA (25 Apr 1983).

Static leach tests (MCC-1P) are being conducted on SRL-131 and MCC 76-68 glasses for a duration of two years. The one-year results from these tests performed at 40°C and 90°C are available. The data indicate similar leaching behavior of the two glasses in deionized water at 90°C. The type of leachant has a marked effect on the normalized elemental mass losses, with the lowest losses observed in brine.

48684 **(SAND—82-2212) Bibliography with abstracts of geological literature pertaining to southern Nevada with particular reference to the Nevada Test Site.** Connolly, J.R.; Hicks, R.T.; Emmanuel, K.M.; Cappon, J.P.; Sinnock, S. (New Mexico Univ., Albuquerque (USA); Sandia National Labs., Albuquerque, NM (USA)). May 1983. Contract AC04-76DP00789. 167p. NTIS, PC A08/MF A01. Order Number DE83013549.

This bibliography (with abstracts) of geological literature pertains to the Nevada Test Site and its southern Nevada environs. Its purpose is to provide a convenient, general reference document for published geological information potentially useful for radioactive waste studies conducted by the Nevada Nuclear Waste Storage Investigation project at the Nevada Test Site. It is organized so that users of geological information about southern Nevada may find subject matter in their areas or topics of interest. The most current published literature included is dated 1980.

48685 **(SKBF-KBS-SP-IR—82-02) Buffer mass test - data aquisition and data processing systems.** Hagvall, B. (Svensk Kaernbraenslefoersoerjning AB, Stockholm). Aug 1982. 19p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702338.

This report describes data aquisition and data processing systems used for the Buffer Mass Test at Stripa. A data aquisition system, designed mainly to provide high reliability, in Stripa produces raw-data log tapes. Copies of these tapes are mailed to the computer center at the University of Lulea for processing of raw-data. The computer systems in Lulea offer a wide range of processing facilities: large mass storage units, several plotting facilities, programs for processing and monitoring of vast amounts of data, etc.

48686 **(SKBF-KBS-SP-IR—82-03) Buffer mass test - software for the data aquisition systems.** Hagvall, B. (Svensk Kaernbraenslefoersoerjning AB, Stockholm). Aug 1982. 58p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702339.

This report describes the data aquisition software for the buffer mass test at Stripa. The software system handles input of information concerning the experiment design as well as measuring and storing of transducer signal values. It also provides a lot of service functions like measuring and printing of transducer signal values, printing of data stored on floppy disks, reporting transducers exceeding their alarm limits, etc.. The system also continuously checks the status of voltmeters, scanners, printers, etc. and reports failing devices. The software is written for a Hewlett Packard 9835A desktop computer.

48687 **(SKBF-KBS-SP-IR—82-06) Buffer mass test - Buffer materials.** Pusch, R.; Boergesson, L.; Nilsson, J. (Svensk Kaernbraenslefoersoerjning AB, Stockholm). Aug 1982. 32p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702342.

Commercial Na bentonite (MX-80) is the clay component of the buffer material in the heater holes as well of the tunnel backfill. Important characteristics are the clay content, liquid limit, X-ray diffraction pattern, water content, and degree of granulation. The ballast material consists of quartz-rich sand and feldspar-rich filler. The preparation of highly compacted bentonite for the near-field isolation of the canister was made by using isostatic compaction technique. The resulting dense bentonite core was cut into regularly shaped blocks which were arranged around each heater and lowered as one unit - heavily instrumented - in the respective deposition holes. For three of the six holes a narrow slot was left open between the bentonite stack and the rock; for the remaining ones a wider slot was chosen with a fill of soft bentonite powder. Both arrangements are expected to yield an ultimate bulk density which is sufficiently high to fulfill the requirement of a negligible permeability and a sufficient swelling pressure as well as heat conductivity, which are the essential parameters. The tunnel backfill, which consists of a mixture of suitably graded ballast material and MX-80

powder, has a considerably lower swelling pressure and heat conductivity, and a higher permeability, all these parameters still within the requirements of the KBS 2 concept. The various zones with different bentonite/sand ratios and the technique to apply them are described in the final part of the report.

48688 (SKBF-KBS-SP-IR—82-07) Buffer mass test - Rock drilling and civil engineering. Pusch, R.; Nilsson, J. (Svensk Kaernbraenslefoersoerjning AB, Stockholm). Sep 1982. 79p. NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702343.

The buffer mass test (BMT) is being run in the former 'ventilation drift' in which a number of rock investigations were previously conducted. A number of vertical pilot holes were drilled from the tunnel floor to get information of the water inflow in possible heater hole position. The final decision of the location of the heater holes was then made, the main principle being that much water should be available in each hole with the possible exception of one of the holes. Thereafter, the diameter 0.76 m heater holes were drilled to a depth of 3-3.3 m. Additional holes were then drilled for rock anchoring of the lids of the four outer heater holes, for the rock mechanical investigation, as well as for a number of water pressure gauges. The inner, about 12 m long part of the tunnel, was separated from the outer by bulwark. The purpose of this construction was to confine a backfill, the requirements of the bulwark being to withstand the swelling pressure as well as the water pressure. Outside the bulwark an approximately 1.5-1.7 m thick concrete slab was cast on the tunnel floor, extending about 24.7 m from the bulwark. Boxing-outs with the same height as the slab and with the horizontal dimensions 1.8 x 1.8 m, were made and rock-anchored concrete lids were cast on top of them after backfilling. The slab which thus represents 'rock', also forms a basal support of the bulwark. The lids permit access to the backfill as well as to the underlying, highly compacted bentonite for rapid direct determination of the water distributin at the intended successive test stops. The construction of the slab and lids will be described in this report.

48689 (SKBF-KBS-SP-IR—82-08) Buffer mass test - Predictions of the behaviour of the bentonite-based buffer materials. Boergesson, L. (Svensk Kaernbraenslefoersoerjning AB, Stockholm). Aug 1982. 95p. NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702344.

The predictions are based on laboratory-derived material parameters and assumed test conditions as they were at the start of the test. The predictions show that the temperature of the bentonite will only slightly exceed 70 degrees C if no drying takes place. The dried-out material may be as hot as 120 degrees C. The rate of the water uptake is highly dependent on the availability of water along the rock surface but not very much on the difference in the amount of water available in the six holes. The predicted time for water saturation in about 2 years in the deposition holes and about 5 years in the tunnel if water is available from the entire rock surface. If water is available from only one or two fractures or narrow zones the highly compacted bentonite and the tunnel backfill will not be water saturated until after more than 100 years. The ultimate heaving of the interface between the highly compacted bentonite and the tunnel backfill is estimated to be 6-12 cm, the maximum swelling pressure is 10-20 MPa.

48690 (SKBF-KBS-TR—81-17) KBS annual report 1981. Including summaries of technical reports issued during 1981. (Svensk Kaernbraenslefoersoerjning AB, Stockholm). May 1982. 133p. NTIS (US Sales Only), PC A07/MF A01. Order Number DE83701474.

The nuclear power utilities have commissioned the jointly owned Swedish Nuclear Fuel Supply Company (SKBF) to assume responsibility for a safe handling of the waste and a safe final storage. KBS is the department within SKBF that is responsible for research and development within the area of radioactive waste management. The government agency of PRAV (the National Council for Radioactive Waste) was dissolved as of mid-year 1981 and its research activities were transferred to SKBF/KBS. Simultaneously, the National Board for Spent Nuclear Fuel, NAK, was created and charged with the duties of overseeing the work being conducted by SKBF within the nuclear waste field and administering the funds that are to be set up for the financing of future waste management activities. The present annual report describes activities within KBS during 1981. The work conducted during the year has been concentrated on three areas: 1) A systematic review has begun of geologically interesting areas in Sweden that might be suitable as sites for a final repository for high level waste or spent fuel. 10-20 areas are scheduled for study during the 1980s. 2) The chemical research has been broadened in order to further understanding of the chemical interplay that exists in the repository between the canister material, the buffer, the waste matrix and the groundwater. The retardation effects associated with the transport of radioactive elements with the groundwater in the bedrock also constitute an important subject of these studies. 3) The preliminary planning and engineering of a final repository for low- and medium-level operating waste from the Swedish reactors is in progress. The aim is to submit an application during the spring of 1982 for permission to build the facility at the Forsmark Nuclear Power Station.

48691 (SKBF-KBS-TR—82-02) Radiolysis of groundwater from HLW stored in copper canisters. Christensen, H.; Bjergbakke, E. (Svensk Kaernbraenslefoersoerjning AB, Stockholm). 29 Jun 1982. 35p. (STUDSVIK-NW—82-273). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702345.

A large number of computer calculations of the radiolysis of ground water outside copper canisters have been carried out. At dose rates higher than 5×10^{-2} rad/s the hydrogen concentration is constant, approximately 10^{-3} mol/dm^3, and independent of time and dose rate. Therefore the rate of diffusion out of the system is constant, approximately 7×10^{-4} mol/year. At dose rates lower than 5×10^{-4} rad/s the logarithm of the hydrogen production is proportional to the logarithm of the dose rate. The hydrogen production depends on fuel type, burn-up and canister thickness only to the extent that the dose rate varies with these parameters. The hydrogen production is dependent of the volume of water in which the energy is assumed to be absorbed (5 or 15 cm layer outside the surface of the canister). The hydrogen production depends on the concentration of Fe^{2+} ions in the water. In the basic calculations the concentration was assumed to be 5 ppm. An increase to 50 ppm increases the total hydrogen production after one million years outside a 1-cm-thick canister from 360 to 1000 mol. A decrease to 0.5 ppm decreases the same yield to 80 mol.

48692 (SKBF-KBS-TR—82-07) Copper/bentonite interaction. Pusch, R. (Svensk Kaernbraenslefoersoerjning AB, Stockholm). 30 Jun 1982. 57p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702328.

The prediction of the processes and rate of corrosion of the KBS 2 copper canisters must be based on a proper scenario, which involves the physical state of the bentonite surrounding the canisters, and the chemical interaction between copper and bentonite. Literature data suggest slow Cu migration and Cu exchanging originally adsorbed cations. Two tests involving copper/bentonite contacts for 3 - 6 months in boreholes have yielded certain valuable information. Thus, Cu ion migration is indeed very slow and where it yields a sufficiently high concentration, it is associated with replacement of originally adsorbed Na ions, which should result in an increased permeability. In one of the tests the copper was separated from the bentonite by a partly air-filled slot. These conditions caused the formation of copper oxides and hydroxides which intermingled with the bentonite that expanded to fill the slot. Due to the low solubility of these copper compounds, the Cu ion concentration was too low to produce ion exchange during the time of observation.

48693 (SKBF-KBS-TR—82-09-1) Radioactive waste management plan. Plan 82. Part 1. General. (Svensk Kaernbraenslefoersoerjning AB, Stockholm). Jun 1982. 80p. NTIS (US Sales Only), PC A05/MF A01. Order Number DE83781076.

Translated from Swedish.

The report is the first account of the nuclear power utilities of Sweden about the plans for the final disposal of the radioactive waste products of the nuclear power. Part 1 describes the general background, the plans for research and development, including the

necessary facilities. The time schedule and the calculated costs of the operations are presented.

48694 **(SKBF-KBS-TR—82-09-2) Radioactive waste management plan. Plan 82. Part 2. Facilities and costs.** (Svensk Kaernbraenslefoersoerjning AB, Stockholm). Jun 1982. 66p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83781071.

The report is the first account of the nuclear power utilities of Sweden concerning the plans for the final disposal of the radioactive waste products of the nuclear power. Part 2 describes the waste facilities in details. The layouts and estimated costs are presented. The decommissioning of nuclear power plants and the postponement of it is discussed.

48695 **(SKBF-KBS-TR—82-11) Radiation levels and absorbed doses around copper canisters containing spent LWR fuel.** Lundgren, K. (Svensk Kaernbraenslefoersoerjning AB, Stockholm). 11 Aug 1982. 60p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702346.

Spent fuel from Swedish LWRs is planned to be enclosed in canisters of copper and be buried in the final repository. The radiation levels during handling of canisters and the radiation energy adsorbed in water (causing radiolysis) have previously been reported. However, there exists a desire to enclose BWR/PWR fuel with higher burnup and use canisters with thinner walls. New radiation source term calculations have been made available and a new concept for making canisters has also been discussed. All this has given rise to a need for new radiation shielding calculations, which are presented in this report.

48696 **Inhibition of nuclear waste glass leaching by chemisorption.** Buckwalter, C.Q.; Pederson, L.R. (Battelle Pacific Northwest Laboratory, Richland, Washington 99352). *Journal of the American Ceramic Society;* **65**: No. 9, 431-436(Sep 1982).

Leaching of waste glass in lead and aluminum containers is much less extreme than in relatively inert Teflon containers. Lead and aluminum are already included in several waste-package designs. The chemical durability imparted to a waste glass by sorption of lead and aluminum corrosion products onto the glass surfaces, as reported in this study, is an additional reason to include these metals in the waste-package assembly. Glass corrosion was inhibited in lead containers even though the solution pH rose to values considerably higher than necessary to accelerate silica dissolution in the absence of lead. Relatively minor effects on glass leaching were found in copper, tin, and titanium containers when compared to those measured in Teflon containers. No sorption of materials from any of these containers onto the glasses was evident, although sorption of glass corrosion products onto the container walls was observed.

48697 **The decontamination of the Curium Source Fabrication Facility.** Schaich, R.W. (Oak Ridge National Laboratory, Oak Ridge, TN 37830). *Transactions of the American Nuclear Society;* **43**: 58-59(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48698 **Decontamination of Battelle-Columbus Laboratories' plutonium facility.** Freas, D.G.; Madia, W.J. (Battelle Columbus Laboratories, 505 King Avenue, Columbus, OH 43201). *Transactions of the American Nuclear Society;* **43**: 59-60(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48699 **Precipitation process for decontamination of water soluble SRP radioactive waste.** Lee, L.M.; Kilpatrick, L.L. (E. I. du Pont de Nemours & Company, Savannah River Laboratory, Aiken, SC 29808). *Transactions of the American Nuclear Society;* **43**: 124-125(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48700 **Decontamination of uranium-contaminated solid waste to releasable levels.** McCoy, M.W.; Gardner, H.R.; Wagner, H.E. (Quadrex Corporation, Richland Services Division, 2952 George Washington Way, Richland, WA 99352). *Transactions of the American Nuclear Society;* **43**: 127(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48701 **Advances in decontamination technology.** Volt, R.E. (NUS Process Services Corporation, 1501 Key Road, Columbia, SC 29201). *Transactions of the American Nuclear Society;* **43**: 127-219(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48702 **Program for reduction of outdoor radiation areas at the 200E and 200W areas of the Hanford Reservation.** Heine, W.F. (Rockwell Hanford Operations, P.O. Box 800, Richland, WA 99352). *Transactions of the American Nuclear Society;* **43**: 57-58(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48703 **Thermomechanical modeling and the selection of a salt repository site.** Tammemagi, H.Y.; Loken, M.C.; Wagner, R.A.; Wigley, M.R. (RE/SPEC Ltd., 4614 Valient Drive, N.W., Suite 201, Calgary, Alberta T3A 0X9). *Transactions of the American Nuclear Society;* **43**: 69-70(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48704 **Post-closure performance assessment methodology for the Office of Nuclear Waste Isolation.** Wilems, R.E.; Brandstetter, A. (INTERA Environmental Consultants, Inc., 11999 Katy Freeway, Suite 610, Houston, TX 77079). *Transactions of the American Nuclear Society;* **43**: 70-71(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48705 **WAPPA: an integrated waste package performance assessment code.** Pearson, F.J.; Brecher, A. (INTERA Environmental Consultants, Inc., 11999 Katy Freeway, Suite 610, Houston, TX 77079). *Transactions of the American Nuclear Society;* **43**: 71-72(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48706 **Application of performance assessment models to evaluate uncertainty in site characterization.** Sykes, J.F.; Andrews, R.W. (INTERA Environmental Consultants, Inc., 11999 Katy Freeway, Suite 610, Houston, TX 77079). *Transactions of the American Nuclear Society;* **43**: 72(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48707 **Satisfying performance assessment data needs.** Baker, S.M.; Clifton, P.M.; Strait, S.R. (Rockwell Hanford Operations, P.O. Box 800, Richland, WA 99352). *Transactions of the American Nuclear Society;* **43**: 73(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48708 **Waste package performance assessment: the importance of the very near-field physicochemical environment.** Jacobs, G.K.; Altenhofen, M.K. (Rockwell Hanford Operations, P.O. Box 800, Richland, WA 99352). *Transactions of the American Nuclear Society;* **43**: 73-75(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48709 **Performance assessment in the Nevada Nuclear Waste Storage Investigations.** Tyler, L.D.; Brannen, J.P.; Hayden, N.K.; Langkopf, B.S. (Sandia National Laboratories, P.O. Box 5800, Albuquerque, NM 87185). *Transactions of the American Nuclear Society;* **43**: 75(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48710 **System study and performance constraints for repository horizon selection at the Nevada Test Site.** Johnstone, J.K.; Lappin, A.R.; Peters, R.R. (Sandia National Laboratories, P.O. Box 5800, Albuquerque, NM 87185). *Transactions of the American Nuclear Society;* **43**: 75-76(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48711 **NWTS program strategy.** Stein, R.; Voss, J.W. (U.S. Department of Energy, Washington, DC 20545). *Transactions of the American Nuclear Society;* **43**: 85(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48712 **Exploratory shaft in basalt - site characterization and development.** Hunt, G.S.; Beilefeld, R.J. (Rockwell Hanford Operations, P.O. Box 800, Richland, WA 99352). *Transactions of the American Nuclear Society;* **43**: 85-86(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48713 **Status of site characterization activities of the Nevada Test Site.** Vieth, D.L. (U.S. Department of Energy, Washington, DC 20545). *Transactions of the American Nuclear Society;* **43**: 86(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48714 **Status of the ONWI salt project.** Madia, W.J.; Matthews, S.C. (Battelle, Office of NWTS Integration, 505 King Avenue, Columbus, OH 43201). *Transactions of the American Nuclear Society;* **43**: 86(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48715 **Licensing considerations for the NWTS program.** Stein, R.; Glora, M.A. (U.S. Department of Energy, Washington, DC 20545). *Transactions of the American Nuclear Society;* **43**: 87(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48716 **Low-level waste: status of regional compacts.** Brown, H. (National Governors' Association, Hall of the States, 444 North Capitol Street, Washington, DC 20001). *Transactions of the American Nuclear Society;* **43**: 95-96(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48717 **Low-level waste management: toward a stable system.** Jordan, E.A.; Nern, C.F. (U.S. Department of Energy, Washington, DC 20545). *Transactions of the American Nuclear Society;* **43**: 96(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48718 **How clean is clean enough? Allowable residual contamination levels.** Napier, B.A.; Kennedy, W.E. Jr. (Battelle-Pacific Northwest Laboratory, P.O. Box 999, Richland, WA 99352). *Transactions of the American Nuclear Society;* **43**: 98-99(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48719 **Allowable residual contamination levels: transuranic advanced disposal systems for defense waste.** Kennedy, W.E. Jr.; Napier, B.A. (Battelle-Pacific Northwest Laboratory, P.O. Box 999, Richland, WA 99352). *Transactions of the American Nuclear Society;* **43**: 99-101(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48720 **Ocean disposal feasibility study: candidate DOE (FUSRAP) soil characterization.** Kupferman, S.L.; Anderson, D.R.; Brush, L.H.; Gomez, L.S.; Shephard, L.E. (Sandia National Laboratories, P.O. Box 5800, Albuquerque, NM 87185). *Transactions of the American Nuclear Society;* **43**: 101(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48721 **Performance requirements for LLW containers and waste forms.** Ensminger, D.A.; Giuffre, M.S.; Kaplan, M.F. (The Analytic Sciences Corporation, One Jacob Way, Reading, MA 01867). *Transactions of the American Nuclear Society;* **43**: 103-104(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48722 **Embedding of radioactive wastes in a thermosetting resin matrix.** Kuribayashi, H.; Kurumada, N.; Yagi, T. (JGC Corporation, 14-1 Bessho 1-chome, Minami-ku, Yokohama 232). *Transactions of the American Nuclear Society;* **43**: 104-106(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48723 **Comparison of candidate glasses to vitrify ICPP calcined alumina waste.** Cole, H.S.; Colton, E.L. (Exxon Nuclear Idaho Co., Inc., P.O. Box 2800, Idaho Falls, ID 83401). *Transactions of the American Nuclear Society;* **43**: 109(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48724 **Immobilization of radioactive liquid waste using water glass.** Uetake, N.; Fukazawa, T.; Kikuchi, M. (Hitachi Ltd., Energy Research Laboratory, 1168 Moriyama-cho, Hitachi-shi, Ibaraki, 316). *Transactions of the American Nuclear Society;* **43**: 110-111(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48725 **Solubility-limited fractional dissolution rate of vitrified waste in groundwater.** Chambre, P.L.; Pigford, T.H.; Zavoshy, S.J. (University of California, Berkeley, CA 94720). *Transactions of the American Nuclear Society;* **43**: 111-112(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48726 **Effect of temperature on the leaching performance of SYNROC-B waste form.** Solomah, A.G. (North Carolina State University, Raleigh, NC 27650). *Transactions of the American Nuclear Society;* **43**: 112-113(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48727 Consequences of radiation effects on zeolites during interim storage. Palau, G.L.; Pillay, K.K.S. (The Pennsylvania State University, University Park, PA 16802). *Transactions of the American Nuclear Society;* **43**: 113-114(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48728 Laboratory studies of fluid flow through borehole seals. South, D.L.; Daemen, J.J.K. (University of Arizona, Tucson, AZ 85721). *Transactions of the American Nuclear Society;* **43**: 114-115(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48729 Water-dilution volume for high-level wastes stored in deep geologic media. Choi, J.S.; Tosetti, R.J. (Bechtel National, Inc., P.O. Box 3965, San Francisco, CA 94119). *Transactions of the American Nuclear Society;* **43**: 122-124(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48730 Radwaste volume reduction and solidification by General Electric. Green, T.A.; Weech, M.E. (General Electric Company, Nuclear Energy Division, 175 Curtner Avenue, San Jose, CA 95125). *Transactions of the American Nuclear Society;* **43**: 129-130(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48731 Evaluation of an asphalt system for an operating Powdex BWR. Nolan, L.L.; Turney, J.H.; Vance, J.N. (Northern States Power Company, 2900 Marshall Street, N.E., Minneapolis, MN 55418). *Transactions of the American Nuclear Society;* **43**: 130-131(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48732 Radwaste volume reduction using mobile processing equipment. Koh, B. (Hittman Nuclear and Development Corporation, 9190 Red Branch Road, Columbia, MD 21045). *Transactions of the American Nuclear Society;* **43**: 131-132(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48733 Technologies for destroying low-level radioactive waste nitrate. Blakeslee, J.J.; Johnson, A.J.; Meile, L.J. (Rockwell International, Rocky Flats Plant, P.O. Box 464, Golden, CO 80401). *Transactions of the American Nuclear Society;* **43**: 132(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48734 A survey of contaminated oil treatment alternatives. Powell, R.H.J. Jr.; Voit, R. (NUS Process Services Corporation, 1501 Key Road, Columbia, SC 29201). *Transactions of the American Nuclear Society;* **43**: 132-133(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

0530 Environmental Aspects

REFER ALSO TO CITATION(S) 48681, 48704, 48707, 48709, 48710, 48711, 48712, 48713, 48714, 48718, 48719, 48720, 48721, 48726, 48729, 49560, 49859

48735 A mechanism for transport of plutonium through soil at the Maxey Flats, Ky., shallow land burial site. Polzer, W.L.; Essington, E.H.; Fowler, E.B. (Los Alamos National Laboratory, P.O. Box 1663, Los Alamos, NM 87545). *Transactions of the American Nuclear Society;* **43**: 63-64(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48736 Effect of solubility-limited dissolution on the migration of radionuclide chains. Sato, Y.; Chambre, P.L.; Fujita, A.; Pigford, T.H. (University of California, Berkeley, CA 94720). *Transactions of the American Nuclear Society;* **43**: 64-66(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48737 Analytical solutions of radionuclide migration with one-dimensional flow in layered media. Gureghian, A.B.; Jansen, G.; Scott, L.A. (Battelle, Office of NWTS Integration, 505 King Avenue, Columbus, OH 43201). *Transactions of the American Nuclear Society;* **43**: 73(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48738 The potential role of biotic transport models in low-level waste management. Kennedy, W.E. Jr.; Cadwell, L.L.; McKenzie, D.H.; Soldat, J.K. (Battelle-Pacific Northwest Laboratory, P.O. Box 999, Richland, WA 99352). *Transactions of the American Nuclear Society;* **43**: 102-103(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

0540 Health And Safety

REFER ALSO TO CITATION(S) 48626, 48646, 48647, 48650, 48652, 48653, 48695, 48697, 48697, 48698, 48700, 48701, 48702, 48703, 48707, 48709, 48710, 49122, 49842, 49846, 49879, 49911

48739 (AD-A—128901/6) Planning for off-site response to radiation accidents in nuclear facilities. Safety series No. 55. (International Atomic Energy Agency, Vienna (Austria)). 1981. 112p. UNIPUB, 345 Park Avenue South, New York, NY 10010 (No copies furnished by DTIC/NTIS).

During the past quarter century, the development of commercial nuclear power with its supporting fuel cycle facilities has been associated with a record of nuclear safety which has in general been excellent. A potential for a serious accident does arise, even though its probability is minimal, and an effective emergency planning and preparedness programme is a necessary part of the support for any nuclear facility. Emergency action could be initiated by: The operator of the nuclear facility; and Public authorities that have the task of protecting the public and the environment. The nuclear facility operator will be concerned with on-site action to control the emergency situation and protect on-site personnel. The nuclear facility operator is also responsible for notifying appropriate public authorities who are responsible for protecting the public and implementing protective measures off-site. The present document provides technical guidance and recommendations for emergency planning to be considered by appropriate authorities. Readers should be aware that the publication is neither a collection of rules nor a list of approved steps and actions. Rather it is a discussion of the various philosophies, problems and recommendations involved in the off-site response to an accident in a nuclear facility.

48740 Experiences with a PFN uranium logging system. Barnard, R.W.; Humphreys, D.R.; Jensen, D.H.; Stephenson, W.A.; Weinlein, J.H. (Special Applications Div., Sandia National Lab, Albuquerque, NM 87185). *IEEE (Institute of Electrical and Electronics Engineers) Transactions on Nuclear Science;* **30**: No. 2, 1664-1667(Apr 1983).

The Prompt Fission Neutron (PFN) uranium logging system has been used by Sandia National Laboratories for field operations for about six years; during that time, the system has been used at several exploration sites from southern Texas to Wyoming. Some of the improvements, recent changes to the system, and new applications are discussed here. A high-voltage doubler has been designed for the neutron generator which permits operation at pulse rates of up to one kHz. Other improvements in hardware have also been

made. The PFN tool has been tested at moderately elevated temperatures (about 93°C). The tool has been used in support of the Uranium Mill Tailings Remedial Action Program (UMTRAP) at various mine tailing sites in Colorado and Wyoming. The log interpretation model has now been completed, and a patent on the system has been issued. The tool design will be released to the National Technical Information Service, and is available for anyone to build and use; the software is also available.

48741 **Repository safety-the salient facts.** Hewitt, W.M. (Battelle, Office of NWTS Integration, 505 King Avenue, Columbus, OH 43201). *Transactions of the American Nuclear Society;* **43**: 68(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48742 **Impacts of recommendations on radiological considerations for an operating repository.** Waite, D.A. (Battelle, Office of NWTS Integration, 505 King Avenue, Columbus, OH 43201). *Transactions of the American Nuclear Society;* **43**: 68-69(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48743 **Consequences of basaltic volcanism through a high-level waste repository.** Hunter, R.L.; Logan, S.E. (Sandia National Laboratories, P.O. Box 5800, Albuquerque, NM 87185). *Transactions of the American Nuclear Society;* **43**: 76-77(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

0550 Regulations

REFER ALSO TO CITATION(S) 48644, 48654, 48671, 48675, 48715, 48716, 48717, 48718, 48719, 49569

48744 **(BNL—33355) Legal constraints imposed on security force personnel.** Cadwell, J.J. (Brookhaven National Lab., Upton, NY (USA)). 1983. Contract AC02-76CH00016. 15p. (CONF-830416—3). NTIS, PC A02/MF A01. Order Number DE83015850.

From American Nuclear Society workshop on power plant security; Savannah, GA, USA (24 Apr 1983).

It is argued that the penalty for most mistakes made by security is the payment of money by the utility. The security personnel has only to act reasonably and not in a negligent manner. Preventing of sabotage is more important than obtaining a conviction, so it is better to search and not get a conviction than it is not to search. (DLC)

48745 **(BNL—33417) Search and seizure law; practical advice and interpretation for nuclear protective force persons.** Cadwell, J.J. (Brookhaven National Lab., Upton, NY (USA)). 6 Jul 1983. Contract AC02-76CH00016. 7p. (CONF-830709—20). NTIS, PC A02/MF A01. Order Number DE83015393.

From 24. annual meeting of the Institute of Nuclear Materials Management; Vail, CO, USA (10 Jul 1983).

Recent Supreme Court decisions, which interpret the 200-year-old Fourth Amendment of the US Constitution, are used to provide a brief overview of some search and seizure subjects important to management and officers responsible for physical protection of nuclear facilities. The overview is framed in practical terms in order to make the comments applicable to the everyday activity of nuclear-protective-force persons. The Supreme Court has described several exceptions where searches and seizures (arrests) are permitted without a warrant, despite the Fourth Amendment which states that warrants are always required. The seven exceptions briefly discussed are search incidents to a lawful arrest, the automobile-search exception, the suitcase or container exception, the hot-pursuit or emergency exception, the stop-and-frisk exception, the plain-view exception, and consent to be searched.

48746 **(NUREG—0430-Vol.3-No.2) Licensed-fuel-facility status report: inventory difference data, July 1982-December 1982. Vol. 3, No. 2.** (Nuclear Regulatory Commission, Washington, DC (USA). Office of Inspection and Enforcement). Jul 1983. 12p. NTIS, PC A02/MF A01 - GPO. Order Number DE83902768.

NRC is committed to the periodic publication of licensed fuel facilities inventory difference data, following agency review of the information and completion of any related investigations. Information in this report includes inventory difference data for active fuel fabrication facilities possessing more than one effective kilogram of high enriched uranium, low enriched uranium, plutonium, or uranium-233.

48747 **(SAND—83-1320) Portable self-contained aqueous foam system for generating high-expansion foam.** Reavis, B.A. (Sandia National Labs., Albuquerque, NM (USA)). Jul 1983. Contract AC04-76DP00789. 39p. NTIS, PC A03/MF A01. Order Number DE83016744.

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A portable self-contained aqueous foam system for safeguards and security application has been designed and tested at Sandia. The foam system was designed to fill room or hallway volumes up to 2000 cu ft with high-expansion aqueous foam. This foam system is unique because of its use of a newly developed, premixed, one-component foam solution and its packaging into a single portable unit. This report describes and documents the system design and its operating characteristics. It also provides some insight into possible application for this type of activated denial system.

48748 **NUMATH: a nuclear material holdup estimator for unit operations and chem'cal processes.** Krichinski, A.M. (Oak Ridge National Laboratory, Oak Ridge, TN 37830). *Transactions of the American Nuclear Society;* **43**: 125-126(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

06 FUSION FUELS

0602 Processing

48749 **Canadian experience with tritium - the basis of a new fusion project.** Drolet, T.S.; Wong, K. (Ontario Hydro, 700 University Avenue, Toronto, Ontario M5G 1X6). *Transactions of the American Nuclear Society;* **43**: 177(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48750 **The experimental program at the tritium systems test assembly.** Anderson, J.L. (Los Alamos National Laboratory, P.O. Box 1663, Los Alamos, NM 87545). *Transactions of the American Nuclear Society;* **43**: 179-180(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

07 ISOTOPE AND RADIATION SOURCE TECHNOLOGY

0701 Physical Isotope Separation

48751 **(IA—1366) Development and design of a negative ion source half life measurement of isotopes I and Br produced in ^{236}U (Nsub(th),F).** Yoresh, I. (Bar-Ilan Univ., Ramat-Gan (Israel)). 1981. 72p. (In Hebrew). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702324.

Thesis.

An integrated negative surface ionization target ion source was developed for the Soreq On-Line Isotope Separator, which is especially efficient for bromine and iodine isotopes. In this work $^{87-90}$Br and $^{138-141}$I were identified by beta activity scans and half-lives of $^{86-89}$Br and $^{137-139}$I were measured.

48752 (IA—1375, pp 242-243) **Improvements in the tellurium isotope separation procedure.** Lempert, G.D.; Menat, M.; Chavet, I.; Kanter, M.; Melnik, M.; Salzman, I.; Zaidey, Y.; Goldstein, Y. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

48753 **(JAERI-M—82-047) Mathematical simulation procedure for single cryogenic distillation column with feedback stream processing six isotopic species of molecular hydrogen.** Kinoshita, M. (Japan Atomic Energy Research Inst., Tokyo). May 1982. 15p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702417.

This report deals with a single cryogenic distillation column with a feedback stream and a catalytic equilibrator for recovering tritium from glovebox atmospheres and other similar sources. Although it processes the six isotopic species of molecular hydrogen, the purpose is separation of protium and tritium without any regard to deuterium. A mathematical simulation procedure is proposed to overcome difficulty in rigorous simulation caused by presence of the feedback stream. The effect of the sidestream location on column performance is explored and the optimum location is approximately determined fixing the feed location under an assumed external feed composition.

48754 **(JAERI-M—82-048) Mathematical simulation of falling liquid film condenser for removal of helium and separation of hydrogen isotopes.** Kinoshita, M.; Bartlit, J.R.; Sherman, R.H. (Japan Atomic Energy Research Inst., Tokyo). May 1982. 36p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702418.

The present paper reports the extension of our previously reported work on mathematical simulation of a falling liquid film condenser. The mathematical model is fully described and its convergence characteristics are explored in detail. More concise parametric studies are made considering the low tritium concentration in the top gas the first priority desired. The gas mixture of 50 - 50 D-T containing 1% H and 5% He is continuously fed to a point near the lower end of the sufficiently long packed section and separated into two streams: the helium gas containing ~10% H_2-HD, and the liquid hydrogen isotopes containing 0.01 ppm He. The operating pressure is about 5 atm.

0702 Radiation Sources

REFER ALSO TO CITATION(S) 48630

48755 (IA—1375, pp 246-247) **Production of industrial americium-241 alpha-sources for use in radioactive lightning conductors.** Dahan, S.D.; Pasi, M. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

48756 **(INIS-mf—7985) Duties of the legal person responsible for radiation protection and of the agent for for radiation protection.** Johlige, H. (Bayerisches Landesamt fuer Umweltschutz, Muenchen (Germany, F.R.)). [nd]. 9p. (In German). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780784.

Radiation protection when handling radioactive materials and X-rays. Expert training course on the basis of present legal regulations, Technische Akademie Esslingen (Germany, F.R.).

The legal-person responsible for radiation protection (Strahlenschutzverantwortlicher) and the agent for radiation protection (Strahlenschutzbeauftragter) have jointly to attend to keep the radiation exposure of persons and material goods that are sensitive to radiation as low as possible while using radioactive materials and operating X-ray units and accelerators. As the persons responsible for the work with radioactive materials they have to take care that the radioactive materials are spread and absorbed into the human body the least possible and that independant of 'paragraph' 46 of the StrlSchV (law on radiological protection) only the least possible quantities of those materials get into the air, the water, and the soil. (orig.).

48757 **(SAND—83-0928) Characterization of an aged WESF capsule.** Kenna, B.T.; Schultz, F.J. (Sandia National Labs., Albuquerque, NM (USA); Oak Ridge National Lab., TN (USA)). Jul 1983. Contract AC04-76DP00789. 41p. NTIS, PC A03/MF A01. Order Number DE83016519.

A joint effort by SNLA and ORNL was initiated for a detailed characterization of an 18-year-old WESF ^{137}Cs source which has been used in the Sandia Irradiator for Dried Sewage Solids. The study included evaluation of the inner and outer stainless steel capsules by optical metallography, electron microprobe, and physical testing. Analysis of the residual atmospheres within the two containers was also done. The CsCl was analyzed for isotopic content and impurities. No potential problem areas, including corrosion, were found.

48758 **Application of cesium-137 gamma irradiation.** Sivinski, J.S. (CH2M HILL, 6121 Indian School Road, Suite 206, Albuquerque, NM 87110). *Transactions of the American Nuclear Society;* **43**: 89(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48759 **Current development in radionuclide light production.** Case, F.N.; Remini, W.C.; Nelson, R.E. (Oak Ridge National Laboratory, Oak Ridge, TN 37830). *Transactions of the American Nuclear Society;* **43**: 89-90(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

48760 **Application of strontium-90 to thermoelectric power generation.** Dick, P.J.; McGrew, J.W. (Teledyne Energy Systems, 110 W. Timonium Road, Timonium, MD 21093). *Transactions of the American Nuclear Society;* **43**: 91-93(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

0703 Isotopic Power Supplies

48761 **(LA—9839-PR) Space Nuclear-Safety Program progress report, February 1983.** Bronisz, S.E. (comp.). (Los Alamos National Lab., NM (USA)). Aug 1983. Contract W-7405-ENG-36. 17p. NTIS, PC A02/MF A01. Order Number DE83016351.

This technical monthly report covers studies related to the use of $^{238}PuO_2$ in radioisotope power systems carried out for the Office of Special Nuclear Projects of the US Department of Energy by Los Alamos National Laboratory. Most of the studies discussed here are ongoing. Results and conclusions may change as the work continues.

08 HYDROGEN

0801 Production

REFER ALSO TO CITATION(S) 48778, 49267, 49267

48762 **(AD-A—127488/5) Hydrogen and sulfur from hydrogen sulfide. II. Ambient temperature electrolysis using oxidation of hydrogen sulfide by air as the prime energy source. Interim report 1 jul 82-31 oct 84.** Fletcher, E.A. (Minnesota Univ., Minneapolis (USA). Dept. of Mechanical Engineering). 15 Apr 1983. 12p. (TR—2). NTIS, PC A02/MF A01.

Hydrogen sulfide recovered from the sweetening of fossil fuels or sought as a mineral for its intrinsic value might be converted, in an electrolytic process which uses atmospheric oxygen, into

pipeline pressure hydrogen and sulfur. Such a process may be an alternative to the Claus Process, which recovers only sulfur and uses the hydrogen wastefully. It is also suggested that electrolysis provides a mechanism by which other gaseous products, as well as hydrogen, may be brought to pipeline pressures easily.

48763 (IA—1375, pp 135) **Chemical storage of light energy by catalytic splitting of water.** Baruch, G.; Haruvy, Y.; Rajbenbach, L.A.; Rafaeloff, R. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

48764 **(PB—83-193938) Biological and synthetic systems for production of hydrogen from water. Final report 1 Jun 80-31 Dec 82.** Krasna, A.I. (Columbia Univ., New York (USA). Dept. of Biochemistry; National Science Foundation, Washington, DC (USA)). 1983. 65p. NTIS, PC A04/MF A01.

The object of the research was to split water by visible light into hydrogen and oxygen gases. The reaction was accomplished in a biological system of hydrogenase containing green algae. Completely synthetic systems were also studied. Results suggest that by coupling the oxidation of thiols with the reduction of disulfides, it should be possible to split water to hydrogen and oxygen with catalytic quantities of thiol.

48765 **(PB—83-211904) Solar-assisted hydrogen generation by photoelectrocatalysis. Final report mar 81-may 82.** Ang, P.G.P.; Richardson, P.F.; Yen, P.H.; Tiller, A.J.; Sammells, A.F. (Institute of Gas Technology, Chicago, IL (USA)). May 1983. 84p. NTIS, PC A05/MF A01.

The goal was to gain a basic understanding of how surface modifications of illuminated semiconductors can enhance the efficiency of photoelectrolytic hydrogen generation. Semiconductor electrodes have been used to carry out photoassisted electrolysis processes for the production of hydrogen from water. Better photoelectrodes will increase the efficiency of these processes. This was accomplished through modification of the semiconductor surface by deposition of electrocatalysts or by photosensitization. Electrolyte modifications can also result in enhanced photoelectrochemical performance from the semiconductor/liquid junction.

0802 Storage

REFER ALSO TO CITATION(S) 49267

0803 Transport

REFER ALSO TO CITATION(S) 49267

0805 Safety

REFER ALSO TO CITATION(S) 49267

09 OTHER SYNTHETIC AND NATURAL FUELS

0901 Hydrocarbon Fuels

REFER ALSO TO CITATION(S) 48519, 49581

48766 **(AD-P—000789/8) Performance characteristics of anaerobic downflow stationary fixed film reactors.** van den Berg, L.; Kennedy, K.J. (National Research Council of Canada, Ottawa, Ontario. Div. of Biological Sciences). 1982. 23p. (CONF-820485—). NTIS, PC A02/MF A01.

From 1. international conference on fixed-film biological processes; Kings Island, OH, USA (20 Apr 1982).

Stationary fixed film reactors operated to ensure a net downflow of substrate have several characteristics different from other retained biomass reactors. The active biomass attaches itself to stationary surface and hence is difficult to wash out. Performance is related to the surface-to-volume of the film support as well as to the composition of the support. Methane production rates of up to 8 cym day at loading rates of up to 30 kg COD/m cym day, are possible. Severe hydraulic and organic overloadings can be tolerated with operation back to normal 24 hours following cessation of mistreatment. Reactors can operate with dilute and concentrated wastes (4000-130,000 mg COD/L) and can change readily over from one waste to another. Intermittent loading at high loading rates are possible. Methane production rates and loading rates decreased linearly with temperature (35) to 10); at 10 C they were about 20% of those at 35 C.

48767 **(AD-P—000791/4) Anaerobic fluidized bed treatment of whey: effect of organic loading rate, temperature and substrate concentration.** Hickey, R.F. (Ecolotrol, Inc., Bethpage, NY (USA)). 1982. 20p. (CONF-820485—). NTIS, PC A02/MF A01.

From 1. international conference on fixed-film biological processes; Kings Island, OH, USA (20 Apr 1982).

The anaerobic biological fluidized bed process has been shown to be an extremely efficient system for the treatment of moderate and high strength industrial wastes. This is due to the extremely high specific surface and mass transfer properties of the fluidized bed system. Reported in this article are the results of over three years of pilot work on generating methane gas from whey using a Hy-FloTM anaerobic fluidized bed. The effect of organic loading rate, influent substrate concentration and temperature has been examined. Energy balances show the process to be a net energy producer, generating between 30.5 and 78.7 times the amount of energy required to operate the system.

48768 **(DOE/ER/10720—11) Study of Fischer-Tropsch synthesis over a silica supported iron catalyst through the use of reactive scavengers.** Wang, C.J. (Texas Univ., Austin (USA)). Aug 1983. Contract AS05-80ER10720. 115p. NTIS, PC A06/MF A01. Order Number DE83015145.

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The synthesis of hydrocarbons from H_2 and CO was studied on a silica-supported Fe catalyst. The synthesis was carried out at 1.54 atm and 200 to 255°C in a differential reactor. Conversion of CO never exceeded 2%. The working catalyst was achieved by transforming Fe_2O_3 into a mixture of Fe_3O_4, bulk carbides, and iron under synthesis conditions. Synthesis product distributions and the rate of methane formation are reported. Trends in CO_2 formation and the presence of cyclic hydrocarbons, saturated and unsaturated, suggest the presence of some Fe_3O_4 at the catalyst surface. Cyclohexene addition to the feed generated low concentrations of alkyl-substituted cyclohexene and cyclohexanes. Pyridine addition to the feed generated alkyl-substituted pyridines. Scavenged products were not formed from interactions between the scavenger and synthesis products on support, indicating that the scavengers react with species involved in chain propagation. Pyridine was used to scavenge C_1 to C_3 alkyl species from the catalyst surface. The α-alkylpyridine distributions were proportional to the dependence of C_1 to C_3 Fischer-Tropsch products. Two probable Fischer-Tropsch mechanisms were derived.

48769 **(DOE/PC/30022—9) Slurry Fischer-Tropsch/Mobil two-stage process of converting syngas to high-octane gasoline. Quarterly report, 1 October-31 December 1982.** Kuo, J.C.W. (Mobil Research and Development Corp., Paulsboro, NJ (USA)). Apr 1983. Contract AC22-80PC30022. 83p. NTIS, PC A05/MF A01. Order Number DE83016379.

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Long-term stability of a $Fe/Cu/K_2CO_3$ Fischer-Tropsch catalyst, designated as I-B, was successfully established using the two-stage bench-scale pilot plant. Eighty-six days on stream operation with high gas throughput and conversion have been demonstrated. A total hydrocarbon production of 815 g/g-Fe was obtained. This is substantially greater than the productions reported in the literature. Process variable studies were carried out during the latter part of the run including pressure, superficial feed-gas velocity, feed H_2/CO ratio, and addition of a potassium-salt. The two-stage bench-scale pilot plant was modified to include devices for

improving separation of the reactor-wax (heavy hydrocarbons retained in the slurry reactor under the operating conditions) and the Fischer-Tropsch catalyst. Detailed analytical procedures and supporting tests for analyzing the hydrogen, the carbon monoxide, the feed-gas, the first-stage Fischer-Tropsch products, and the second-stage ZSM-5 products are summarized. Due to the wide distribution and diversity of the Fischer-Tropsch products, comprehensive analytical schemes were developed with great effort. Gasoline stability tests for gum formation and oxidation showed that existent (heptane washed) gum contents were all within acceptable limits for conventional gasoline, as were the oxidation stabilities indicated by the induction period method. However, total residues on evaporation (unwashed gum) were generally high, probably due to the presence of a small amount of high-boiling, heptane-soluble hydrocarbons.

48770 **(DOE/PC/50791—T2) Fischer-Tropsch synthesis from a low H_2:CO gas in a dry fluidized-bed system. Technical progress report, April 1-June 30, 1983.** Liu, Y.A.; Squires, A.M.; Konrad, K. (Virginia Polytechnic Inst. and State Univ., Blacksburg (USA). Dept. of Chemical Engineering). 1983. Contract FG22-82PC50791. 128p. NTIS, PC A07/MF A01. Order Number DE83015824.

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The objective of this project is to experimentally develop and demonstrate a novel dry fluidized-bed reactor system (called heat tray) for Fischer-Tropsch synthesis from a low H_2:CO gas. The new reactor involves conducting catalytic synthesis reactions primarily in a horizontal conveying zone, in which fine particles of iron catalyst are carried in a relatively dilute suspension by a large flow of reacting gas. A secondary reaction zone, in the form of a shallow fluidized bed of catalyst particles, is situated beneath the primary reaction zone. This shallow bed also has immersed horizontal heat-transfer tubes for removing reaction heat. A major thrust of the new reactor development is to prevent carbon deposits from forming on the iron catalyst, which cause deactivation and physical degradation. This is to be achieved by conducting the Fischer-Tropsch synthesis in an unsteady-state mode, particularly by alternately exposing the iron catalyst to a large flow of low H_2:CO gas for a short period of time and to a small flow of H_2-rich gas for a long period of time. Experimental work was initiated on the unsteady-state Fischer-Tropsch synthesis using a fully-automated vibrofluidized microreactor system and a computer-controlled on-line gas chromatographic (GC) system for product analysis. Both the reactor and GC systems performed well in all experiments, and no mechanical problems were observed throughout the experiments lasting as long as twenty hours. Preliminary estimates indicated that the conversion of CO to carbon was only on the order of one-tenth of one percent. This encouraging result provided evidence that it should be possible to experimentally identify cycling conditions which could prevent carbon deposits on the catalyst while treating a synthesis gas of low H_2:CO ratio.

48771 **(DOE/PC/50804—3) CO + H_2 reaction over nitrogen-modified iron catalysts. Quarterly technical progress report, April 1, 1983-June 30, 1983.** Delgass, W.N. (Purdue Univ., Lafayette, IN (USA). School of Chemical Engineering). 1983. Contract FG22-82PC50804. 29p. NTIS, PC A03/MF A01. Order Number DE83016747.

The objective of this work is to examine the effects of nitrogen, as nitride and as a gas-phase reactant, on hydrocarbon synthesis reactions over iron catalysts. This is the third quarterly period of a three-year program. Procedures for preparing the pure γ'-Fe_4N and zeta-Fe_2N bulk phases have been refined and these phases have been confirmed by Moessbauer spectroscopy. After four hours of Fischer-Tropsch reaction with a 3/1 mixture of H_2/CO at 523 K both unsupported nitrides form new phases, presumably carbonitrides, retaining little of the original nitride structure. A pure γ'-Fe_4N was prepared from a highly dispersed iron on carbolac. Moessbauer spectrum of this sample after reaction showed considerable retention of the nitride phase. The stability of this catalyst was further reflected in a steady reactivity and selectivity during synthesis, in contrast to the gradual activity loss over the unsupported catalysts. Kinetic measurements suggest a hydrogen deficient surface during the first minutes of exposure to synthesis gas. These preliminary studies identify the short time behavior of the catalysts as worthy of more thorough study by transient methods. 6 figures, 1 table.

48772 **(DOE/R1/10372—T1) Design and construction of a mobile biomass gasifier close-coupled to an engine-generator set.** (Snyder Associates, Inc., Essex, CT (USA)). 30 Apr 1982. Contract FG41-80R110372. 77p. NTIS, PC A05/MF A01. Order Number DE83016272.

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The purpose of this project was to demonstrate hardware that can be used in specific power generation applications to reduce the use of liquid petroleum fuels. Objectives that have been met include the following: (1) a fixed-bed, updraft biomass gasifier that is close-coupled to an engine/generator set has been designed, constructed and operated; (2) a design approach has been followed that utilizes locally available materials and construction methods; (3) a cost analysis has been completed to project the costs of power generated with a 2-kw biomass powered generator set - this power cost has been compared with the cost of power generated in the same engine/generator when the system is operated on gasoline; (4) a technical report, technical drawings and two public articles have been produced to disseminate project results. The cost of electric power derived from gasoline and biomass have been estimated to be $1.10 and $2.25/kw-h (1982 dollars) respectively. The author has concluded that small biomass gasifiers close-coupled to engine/generator sets are not cost competitive in the 1981 marketplace. When applied to small-scale electric power generation applications, biomass gasification is labor intensive, capital intensive, and presents hazards that may require significant product liability costs for the small manufacturer. The low thermal efficiency of the internal combustion engine lowers the overall thermal efficiency of the biomass electricity conversion process to 9.9 percent. The resulting system is approximately three times as heavy as a simple engine/generator that is gasoline powered; thus, mobility is restricted. It is recommended that large-scale systems be investigated to determine whether labor and capital costs can be reduced.

48773 **(DOE/RA/50363—1) Feasibility study for utilization of landfill gas at the Royalton Road Landfill, Broadview Heights, Ohio. Final report.** (Norton Construction Co., Independence, OH (USA)). Sep 1983. Contract FG01-80RA50363. 125p. NTIS, PC A06/MF A01. Order Number DE83016961.

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The technical viability of landfill gas recovery has been previously demonstrated at numerous sites. However, the economics of a full scale utilization system are dependent on proper market conditions, appropriate technologies, landfill gas quantity and quality, and public/purchaser acceptance. The specific objectives of this feasibility study were to determine: The available markets which might purchase landfill gas or landfill gas derived energy products; An extraction system concept design and to perform an on-site pumping test program; The landfill gas utilization technologies most appropriate for the site; Any adverse environmental, health, safety, or socioeconomic impacts associated with the various proposed technologies; The optimum project economics, based on markets and processes examined. Findings and recommendations were presented which review the feasibility of a landfill gas utilization facility on the Royalton Road Landfill. The three identified utilization alternatives are indeed technically feasible. However, current market considerations indicate that installation of a full scale system is not economically advisable at this time. This final report encompasses work performed by SCS Engineers from late 1980 to the present. Monitoring data from several extraction and monitoring wells is presented, including pumping rates and gas quality and quantity analysis. The Market Analysis Data Form, local climatological data, and barometric pressure data are included in the appendix section. 33 figures, 25 tables.

48774 **(LBL—15295) Energy & Environment Division annual report. Chemical process research and development program, FY 1982.** Cairns, E.J. (Lawrence Berkeley Lab., CA (USA)). Jun 1983. Contract AC03-76SF00098. 53p. NTIS, PC A04/MF A01. Order Number DE83016416.

Highlights of accomplishments during 1982 are summarized. Discussion is presented under the broad headings: chemical liquefaction of biomass; bioconversion of biomass; oil shale and petroleum related research; coal related research; and electrochemical energy storage research. Separate abstracts have been prepared for each phase of the research program for inclusion in the Energy Data Base. (DMC)

48775 (LBL—15295, pp 1.2-1.6) **Direct liquefaction of biomass.** Davis, H.G.; Figueroa, C.; Gansley, R.; Schaleger, L.L.; Watt, D. Jun 1983. NTIS, PC A04/MF A01. Contract AC03-76SF00098;AC06-76RL01830.

In Energy & Environment Division annual report. Chemical process research and development program, FY 1982.

Highlights of accomplishments during 1982 as well as planned activities for 1983 are summarized. The usual objective of synthetic liquid fuel programs has been the production of high-quality distillate fuels. Here the product that arises most readily is a heavy, bituminous material, pumpable as a liquid but generally suitable only as boiler fuel. The liquefaction program is being revamped to focus on the production of a distillate fuel using a solvolysis method. In FY 1982, our continuous liquefaction unit (CLU) was operated successfully to obtain operating conditions and product-yield distributions for the LBL, or water-slurry, liquefaction process. By comparing these results with those for the PERC, or wet-oil recycle, process, we established the strengths and failings of the two approaches. Our ability to characterize the products of liquefaction improved considerably. We modified the SESC technique of sequential elution, which we adapted to biomass oils in 1981, to improve speed and reproducibility. It is proving to be a useful tool for following product changes that result from changes in operations. We have also applied various forms of high-performance liquid chromatography (HPLC) to improve our characterization of water-soluble products, molecular-weight distributions, and other features.

48776 (PB—83-195362) **Methane production by anaerobic digestion of algae. Final report.** Nyns, E.J.; Naveau, H.P. (Commission of the European Communities, Luxembourg). [nd]. 411p. (EUR—7685-EN-FR). NTIS, PC A14/MF E14.

Methane is produced experimentally by anaerobic fermentation of algae, principally of species Hydrodictyon and Cladophora, grown in cooling water from nuclear power plants. The accumulation of fatty acids, by-products of fermentation, is found to have an inhibitory effect on methane production. Methods to remove fatty acids and stabilise the reaction are investigated. An economic analysis is presented using a financial model processor based on data from experimental digesters. The experimental work is described and the results are presented in an Appendix (in French). Seven relevant papers, of which two are in French are also annexed.

48777 (PB—83-222158) **Economic and systems assessment of the concept of nearshore kelp farming for methane production. Final report Jun 82-May 83.** Brehany, J.J. (Parsons (Ralph M.) Co., Pasadena, CA (USA); Gas Research Inst., Chicago, IL (USA)). Apr 1983. 340p. NTIS, PC A15/MF A01.

This is the final report of a study undertaken to quantify the cost of production of pipeline quality methane from the anaerobic digestion of California giant brown kelp, macrocystis. Utilizing state-of-the-art knowledge and techniques, kelp would be grown in nearshore farms in 20- to 80-ft-deep ocean waters off the coast of Southern California. It would be harvested, shredded, and pumped as slurry to a central anaerobic biodigestion plant. The kelp would be digested and the resulting gas refined to essentially pure methane. The residue would be a liquid effluent, which would be returned to sea as a nutrient for the kelp farm. Detailed capital and operating costs are estimated for several sizes of farm and plant and an economic model is developed that is capable of interacting between various system components so it can be used to test the effect of changes or improvements in individual subsystems on the levelized product cost of the total system.

48778 (PNL—4594) **Catalytic gasification studies in a pressurized fluid-bed unit.** Mudge, L.K.; Baker, E.G.; Mitchell, D.H.; Robertus, R.J.; Brown, M.D. (Pacific Northwest Lab., Richland, WA (USA)). Jul 1983. Contract AC06-76RL01830. 132p. NTIS, PC A07/MF A01. Order Number DE83016754.

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The purpose of the project is to evaluate the technical and economic feasibility of producing specific gas products via the catalytic gasification of biomass. This report presents the results of research conducted from October 1980 to November 1982. In the laboratory scale studis, active catalysts were developed for generation of synthesis gases from wood by steam gasification. A trimetallic catalyst, Ni-Co-Mo on silica-alumina doped with 2 wt % Na, was found to retain activity indefinitely for generation of a methanol synthesis gas from wood at 1380°F (750°C) and 1 atm (100 kPa) absolute pressure. Catalysts for generation of a methane-rich gas were deactivated rapidly and could not be regenerated as required for economic application. Sodium carbonate and potassium carbonate were effective as catalysts for conversion of wood to synthesis gases and methane-rich gas and should be economically viable. Catalytic gasification conditions were found to be suitable for processing of alternative feedstocks: bagasse, alfalfa, rice hulls, and almond hulls. The PDU was operated successfully at absolute pressures of up to 10 atm (1000 kPa) and temperatures of up to 1380°F (750°C). Yields of synthesis gases at elevated pressure were greater than those used for previous economic evaluations. A trimetallic catalyst, Ni-Cu-Mo on silica-alumina, did not display a long life as did the doped trimetallic catalyst used in laboratory studies. A computer program for a Radio Shack TRS-80 Model I microcomputer was developed to evaluate rapidly the economics of producing either methane or methanol from wood. The program is based on economic evaluations reported in previous studies. Improved yields from the PDU studies were found to result in a reduction of about 9 cents/gal in methanol cost.

48779 (SERI/CP—231-1924) **Fuel gas production from animal and agricultural residues and biomass: proceedings of the December 1982 Anaerobic Digestion Program review meeting.** (Solar Energy Research Inst., Golden, CO (USA)). Mar 1983. Contract AC02-77CH00178. 112p. (CONF-821249—). NTIS, PC A06/MF A01. Order Number DE83011965.

From SERI anaerobic digestion program review meeting on fuel gas production from animal and agricultural residues and biomass; Golden, CO, USA (6 Dec 1982).

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An Anaerobic Digestion Program contractors review meeting was held December 6, 1982 at SERI. This report is a compilation of the progress reports presented by the contractors. These reports present the research obtained by the contractors during the preceding six months. Separate abstracts have been prepared for each report for inclusion in the Energy Data Base.

48780 (SERI/CP—231-1924, pp 1-19) **Autohydrolysis of organic residues to increase biodegradability to methane.** McCarty, P.L.; Baugh, K.; Bachmann, A.; Beard, V.; Levy, J. (Stanford Univ., CA). Mar 1983. NTIS, PC A06/MF A01. (CONF-821249—).

From SERI anaerobic digestion program review meeting on fuel gas production from animal and agricultural residues and biomass; Golden, CO, USA (6 Dec 1982).

The objective of this overall study is to evaluate thermochemical pretreatment as a method for increasing the anaerobic biodegradability of organic materials so that they can be more completely fermented to methane gas, a potential source of fuel. The present study has five specific phases: (1) semi-continuous autohydrolysis system operation; (2) autohydrolysis process optimization; (3) anaerobic treatment optimization; (4) autohydrolysis of agricultural residues; and (5) biodegradation of lignin and lignin fractions. The last phase has been completed and so this report covers work only on the first four phases.

48781 (SERI/CP—231-1924, pp 21-39) **Continuous culture biomass fermentation studies.** Clausen, E.C.; Gaddy, J.L. (Univ. of Arkansas, Fayetteville). Mar 1983. NTIS, PC A06/MF A01. (CONF-821249—).

From SERI anaerobic digestion program review meeting on fuel gas production from animal and agricultural residues and biomass; Golden, CO, USA (6 Dec 1982).

The purpose of this study is to evaluate the reaction kinetics of anaerobic digestion of lignocellulosic materials to methane at increased solids feed concentrations and to improve the reaction rate constant by culture enhancement and cell recycle. During the past contract year, a kinetic model was developed for the production of methane from corn stover in continuous culture. These data were to serve as a kinetic standard for comparison of all subsequent kinetic improvements. Ten semi-continuous bioreactors have been built and placed in operation. The gas produced is collected and monitored daily. A mixture of corn stover water is the standard feed. For the high-solids experiments, 2 reactors were constructed with oversized motors and gas production was monitored daily as well. The significance of the high solids data is that by employing this technique in a commercial facility, the reactor volume can be cut in half for the same methane output, at least at a 60-day retention. Results of the culture enhancement studies are also presented and future plans are discussed. (DMC)

48782 (SERI/CP—231-1924, pp 41-61) **Methane from manure-straw mixtures.** Hashimoto, A.G. (Dept. of Agriculture, Clay Center, Nebraska). Mar 1983. NTIS, PC A06/MF A01. (CONF-821249—).

From SERI anaerobic digestion program review meeting on fuel gas production from animal and agricultural residues and biomass; Golden, CO, USA (6 Dec 1982).

The objective of this effort is to develop an economically viable system to produce methane for energy from manure-crop residue mixtures. In the short term, this project will develop data on the rate and ultimate biodegradability of manure-crop residue mixtures subject to various pretreatments prior to anaerobic fermentation, and will provide basic data for a pilot-scale testing program. The effects of temperature (35 and 55°C) and straw-manure mixtures (90, 75, 50, and 0% straw) on methane (CH_4) production were studied using laboratory-scale fermentors. Batch fermentations showed that the ultimate CH_4 yield (B_0) of straw-manure mixtures was directly proportional to the relative proportion and B_0 of the individual components. Also, hammer or ball milling did not increase the B_0 of straw. Kinetic analysis showed that fermentation stress occurred when the straw content of straw-manure mixtures was higher than 40% at 35°C, and higher than 75% at 55°C. This fermentation stress was observed to occur when the free-ammonia concentration was below 10 g/m^3.

48783 (SERI/CP—231-1924, pp 75-82) **Biotechnology of anaerobic digestion.** Grohmann, K. (Solar Energy Research Inst., Golden, CO). Mar 1983. NTIS, PC A06/MF A01. (CONF-821249—).

From SERI anaerobic digestion program review meeting on fuel gas production from animal and agricultural residues and biomass; Golden, CO, USA (6 Dec 1982).

Previous research has shown that certain chemical and physical pretreatments can have dramatic effects on digestibility of lignocellulosic biomass. An option being investigated under the current task involves phosphoric acid catalyzed leaching of hemicellulosic carbohydrates from biomass followed by direct anaerobic digestion of oligosaccharides and acetate to methane. Since the distinct possibility exists, that rate and yield of digestion can be increased further by supplementation with hemicellulolytic enzymes, the option has been included as well. The investigations in this area were hampered by the lack of microorganisms capable of rapid xylan degradation under anaerobic conditions. Therefore a screening effort was launched under Phase I to isolate such microorganisms in pure cultures, isolate hydrolytic enzymes produced by these microorganisms and evaluate their suitability for hydrolysis of hemicellulosic carbohydrates. Approximately ten pure strains of anaerobic thermophilic microorganisms fermenting larchwood xylan were isolated from enrichment cultures obtained at thermal areas of Yellowstone National Park. Major accomplishments during the first part of phase I were preliminary results on induction of xylanase enzyme in batch cultures, design of the purification scheme for isolation of individual components of xylanase complex and purification of β-xylosidase.

48784 (SERI/CP—231-1924, pp 83-89) **Nutritional stimulation of methanogenic bacteria.** Speece, R.E.; Parkin, G.F. (Drexel Univ., Philadelphia, PA). Mar 1983. NTIS, PC A06/MF A01. (CONF-821249—).

From SERI anaerobic digestion program review meeting on fuel gas production from animal and agricultural residues and biomass; Golden, CO, USA (6 Dec 1982).

The objective of this research project is to identify organic and/or inorganic nutrients and their appropriate concentrations which are capable of stimulating the growth of methanogenic bacteria. Such stimulation will be reflected in higher rates of methane production from anaerobic digesters being fed biomass when the rate-limiting step is acetate conversion to methane. Stimulation can be based upon volumetric loading rates or methane production rates as well as upon specific acetate utilization activity of the microorganisms mediating the conversion. Our objective in this research is to achieve both an increase in microorganisms and an increase in the specific acetate utilization activity of the microorganisms by nutritional stimulation. In the previous budget year, nutritional stimulation to a short, temporary peak of 51 gm/1-day and specific activity of 7.8 gm/gm-day was achieved when no phosphate was supplemented. With daily phosphate addition, the acetate utilization rate was stimulated to between 20 and 30 gm/1-day for an extended period of 25 days with a corresponding unit specific activity or approximately 10 gm/gm day. The inclusion of nickel in the Supplemental Acetic Acid Feed (with no daily addition of 100 mg/1-day of yeast extract) resulted in unit specific activity rates of 10 gm/gm-day. When 100 mg/1-day of yeast extract was supplemented once daily directly to the reactor and nickel was included in the Supplemented Acetic Acid Feed, specific acetate utilization rates as high as 12 to 15 gm/gm-day were observed. With yeast extract supplementation only, the highest VSS observed was 1800 mg/1. When nickel, iron, and cobalt only were supplemented, the highest VSS observed was 3000 mg/1. When nickel, iron, cobalt, and yeast extract were all supplemented, the highest VSS observed was 7000 mg/1.

0902 Alcohol Fuels

REFER ALSO TO CITATION(S) 48889, 49448

48785 **(AD-P—000783/1) Alcohol production with the bacterium Zymomonas.** Clyde, R.A. (Clyde Engineering Service, Sanford, NC (USA)). 1982. 8p. (CONF-820485—). NTIS, PC A02/MF A01.

From 1. international conference on fixed-film biological processes; Kings Island, OH, USA (20 Apr 1982).

At present there is plenty of petroleum, but conditions in the mid-East could change this overnight, so it would seem advisable to be prepared. Zymomonas mobilis ATCC 10988 has been found to attach readily to fibers such as cotton, Orlon and polyester. The bacteria are smaller than yeast, get in between the small fibers to present a large area to the sugar being pumped through, and react several times faster than yeast. Vigorous evolution of CO2 in a vertical fermenter prevents plug flow, so horizontal fermenters are used. In a once through operation, pumping sugar slowly through stationary fibers, it took 25 hours to get an 80% yield, but when rotating the fibers, it took only 18 minutes residence time. Operation of an inclined, rotating fermenter is described, as well as several reactor configurations for commercial operations.

48786 **(DOE/CS/50009—01) Opportunities for coal-to-methanol conversion.** (American Energy Research Co., McLean, VA). Apr 1980. Contract AC01-79CS50009. 77p. NTIS, PC A05/MF A01. Order Number DE83016421.

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The accumulations of mining residues in the anthracite coal regions of Pennsylvania offer a unique opportunity to convert the coal content into methanol that could be utilized in that area as an alternative to gasoline or to extend the supplies through blending. Additional demand may develop through the requirements of

public utility gas turbines located in that region. The cost to run this refuse through coal preparation plants may result in a clean coal at about $17.00 per ton. After gasification and synthesis in a 5000 ton per day facility, a cost of methanol of approximately $3.84 per million Btu is obtained using utility financing. If the coal is to be brought in by truck or rail from a distance of approximately 60 miles, the cost of methanol would range between $4.64 and $5.50 per million Btu depending upon the mode of transportation. The distribution costs to move the methanol from the synthesis plant to the pump could add, at a minimum, $2.36 per million Btu to the cost. In total, the delivered cost at the pump for methanol produced from coal mining wastes could range between $6.20 and $7.86 per million Btu.

48787 **(DOE/ID/12345—T1) Enzymatic conversion of unusual cellulosic wastes to alcohol fuel. Alcohol-Fuels Grant Program.** Pye, E.K. (Pennsylvania Univ., Philadelphia (USA)). Feb 1983. Contract FG07-81ID12345. 76p. NTIS, PC A05/MF A01. Order Number DE83016592.

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Samples of unusual cellulosic wastes from a Sulfite pulp mill, spent mushroom compost and wastes from a cellophane manufacturing plant were collected and analyzed for saccharide content. This analysis showed that the pulp mill wastes (fines) had the greatest cellulose content (~ 78%), while the cellophane wastes contained up to 40% cellulose and the mushroom compost only 20 to 25% cellulose. The mushroom compost could not be used both technically and economically as a substrate for ethanol production. The cellulose in the pulp mill waste was readily hydrolyzed to cellobiose by the extracellular enzymes of Thermomonospora fusca YX but required substantial quantities of β-glucosidase activity in order to generate glucose. The glucose produced could be easily fermented by both Saccharmoyces yeast and Thermoanaerobacter ethanolicus. The use of T. ethanolicus eliminated the need for β-glucosidase additions but gave low yields and low conversions. Under the best of circumstances, 60 to 70% of the cellulose was hydrolyzed and converted to ethanol. However, ethanol concentrations greater than 1% w/v were rarely achieved, thus leading to high recovery costs for ethanol. To overcome these problems two process recommendations have been made. One is a novel design for high temperature enzymatic saccharification of cellulose in a countercurrent tower design, followed by fermentation of the sugar stream in a thermophilic fermentation in a packed bed containing immobilized Thermoanaerobacter ethanolicus. This design should reduce the need for costly enzyme and provide a continuous process. The second design is more conventional and uses a sulfur dioxide catalyzed hydrolysis of cellulose followed by yeast fermentation.

48788 (LBL—15295, pp 1.6-1.11) **Bioconversion of cellulose.** Blanch, H.W.; Wilke, C.R.; Sciamanna, A.F.; Murphy, K.; Wiley, D.; Wong, H. Jun 1983. NTIS, PC A04/MF A01. Contract AC03-76SF00098.

In Energy & Environment Division annual report. Chemical process research and development program, FY 1982.

This program consists of 3 separate studies: studies of the mechanism and kinetics of cellulose hydrolysis; fundamental studies of high-productivity fermentations and yeast nutrition; and models of yeast growth, ethanol production, and oxygen uptake under fermentation conditions. Highlights of progress accomplished during 1982 as well as planned activities for 1983 are summarized. (DMC)

48789 (LBL—15295, pp 1.11-1.18) **Production of sugars from cellulose.** Wilke, C.R.; Blanch, H.W.; Hendy, N.; Maiorella, B.; Mancuso, A.; Murphy, K.; Orichowskyj, S.; Sciamanna, A. Jun 1983. NTIS, PC A04/MF A01. Contract AC03-76SF00098.

In Energy & Environment Division annual report. Chemical process research and development program, FY 1982.

This research has focused on the hydrolysis of lignocellulosic materials to sugars and their subsequent fermentation to ethanol and other fuel-grade chemicals. Applied studies have examined the kinetics of enzymatic hydrolysis of cellulose and hemicellulose fractions for optimal sugar production; the physical and chemical nature of the raw materials; the optimal production and recovery of enzymes; and the use of new organisms for converting polymeric pentosans and hexosans to sugars. Optimization of the continuous ethanol removal and recovery process, as well as alternative methods of fermentation to ethanol, have also been studied. In all this work, the economic impact of each process change is evaluated.

48790 **(PB—83-192062) Analysis of the economic impacts from ethanol production in three New York State regions. Final report.** Batista, J.C.; Boisvert, R.N.; Kalter, R.J. (Cornell Univ., Ithaca, NY (USA); New York State Energy Research and Development Authority, Albany (USA)). Nov 1982. 142p. NTIS, PC A07/MF A01.

This report describes the potential local economic impact of ethanol production industries for three multi-county regions of New York State. The study's input-output analysis suggests that investment in a small cheese whey-ethanol plant would generate far more local employment, per gallon of annual capacity, than a large corn-based plant which would rely more heavily on feedstocks from the outside region. In addition, a cheese whey ethanol plant's impact on dairies in the region would have a greater effect on the local economy than the ethanol plant itself.

0904 Solid Waste And Wood Fuels

48791 **(SERI/TR—256-1477) Technical and economic review of wood energy systems for military bases.** Flowers, L.; Junge, D.; Levi, M.; O'Grady, M. (Solar Energy Research Inst., Golden, CO (USA)). Jun 1983. Contract AC02-77CH00178. 199p. NTIS, PC A09/MF A01. Order Number DE83011985.

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This report combines two reports dealing with industrial-sized wood combustion technology. As part of its industrial wood combustion effort, SERI's former Industrial Applications and Analysis Branch (IAAB) contracted with the Air Force through the Department of Energy (DOE) to review wood fuels and equipment and to perform an economic sensitivity analysis of small-scale industrial-sized wood combustion investments that might be considered for steam and/or electricity generation at Air Force Bases. Additionally, in 1979, SERI's IAAB contracted with North Carolina State University to produce the Decision Makers' Guide to Wood Fuel for Small Industrial Energy Use. These two reports have been combined to provide the Air Force with a comprehensive guide to wood energy combustion. Discussion is presented under the headings: comparison of wood fuels with conventional boiler fuels; densified biomass; fuel storage; fuel handling and preparation; wood-fired equipment; gasification of wood; retrofitting fossil-fuel boilers; cogeneration; pollution abatement; wood energy system economics and procurement of wood fuels. (DMC)

13 Environmental Aspects

REFER ALSO TO CITATION(S) 49877, 49900

14 SOLAR ENERGY

48792 **(SERI/SP—411-582) Report on visit of US solar-energy specialist team to Israel, 9-14 September 1979.** Goldberg, M.D. (Solar Energy Research Inst., Golden, CO (USA)). Mar 1980. Contract AC02-77CH00178. 65p. NTIS, PC A04/MF A01. Order Number DE83014399.

US and Israeli teams met in Jerusalem to discuss an agreement for cooperative research and development in energy and to specify initial programs in solar energy. Detailed discussions resulted in the development of a number of project description documents and broad concurrence on the content of an umbrella agreement. This report provides a record of that meeting; the agreement and list of projects are appended.

1401 Resources And Availability

REFER ALSO TO CITATION(S) 49339, 49340, 49342, 49343, 49344, 49346, 49347, 49382, 49385, 49389

48793 (CONF-830229—, pp 29-32) **Film: dynamic aspects of daylight.** Kendrick, J.D.; Harfield, S.; Docherty, M. (Univ. of Adelaide, Australia). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A film presentation is described using time-lapse photography to explore, in accelerated form, some of the qualitative and quantitative aspects of daylight. The use of the time-lapse technique emphasizes and gives greater perceptive awareness of daylight conditions and draws attention to the need for further study and development of methods of dynamic considerations in daylighting design rather than the current static approach. The film sequences are generally based on the condensation of available daylight hours into 2 1/2 minutes, thus allowing the emphasized portrayal of variation in daylighting in a domestic living room; in sky conditions; sunlight and shadow movement; the play of light and shade; brightness pattern changes and colour changes; and in changes in views through windows. All photography was undertaken in Adelaide, South Australia, between January and May 1980, and reflects the summer and autumn sunlight and daylight conditions then prevailing.

48794 (CONF-830229—, pp 33-40) **Classification of radiation sites in terms of different indices of atmospheric transparency.** Dogniaux, R.; Lemoine, M. (Institut Royal Meteorologique de Belgique, Brussels). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Systematic studies were achieved for correlating the global radiation with the relative sunshine duration and for determining the variations of their coefficients on a geographical scale as function of the radiation climatic area. The sum A + B of the coefficients of the well-known Angstroem regression equation can be regarded as a parameter characterizing the average monthly or annual conditions of the transparency of the atmosphere at a given station. This index called atmospheric transparency index (ATI) is a linear function of the latitude and of the Linke turbidity factor. A recapitulative table summarizes the different indices allowing to characterize a site. By an appropriate choice of them, it is possible to estimate with a reasonable accuracy the daily global irradiation of a site.

1403 Economics

REFER ALSO TO CITATION(S) 48802

48795 (CONF-830222—, pp 95-98) **Economic projections for flat-plate crystalline silicon technologies.** Henry, P.K. (Jet Propulsion Lab., Pasadena, CA). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

1404 Environmental, Legal, And Institutional Aspects

48796 (CONF-830222—, pp 201-208) **International applications.** Johnson, R.O. (Strategies Unlimited, Mountain View, CA). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

International photovoltaic applications are characterized in terms of: type, volume and trend, and similarities to domestic applications. The interactive role of large domestic applications, in developing the international market, is discussed. A comparison is drawn between US national photovoltaic strategy and the strategies typical of various other nations. The rationale for the views of other countries toward the international PV market and the relative position of US manufacturers is discussed.

48797 (DOE/CS/30654—T1) **Model Solar Document project. Final report.** (National League of Cities, Washington, DC (USA)). 1982. Contract FG01-81CS30654. 9p. NTIS, PC A02/MF A01. Order Number DE83016585.

The National League of Cities's American Institute for Municipal Research, education and training undertook to provide consulting services to the Council of American Building Officials (CABO) in support of the Model Solar Energy Document. The tasks undertaken are discussed.

1405 Solar Energy Conversion

REFER ALSO TO CITATION(S) 48763, 48772, 48773, 48774, 48775, 48776, 48777, 48778, 48779, 48780, 48781, 48782, 48783, 48784, 48785, 48787, 48788, 48789, 48790, 48791, 48795, 48914, 48915, 48916, 48917, 49320, 49528, 49531, 49596

48798 (AAEC/E—549) **Simple ion implantation system for solar cells.** Kenny, M.J.; Bird, J.R.; Broe, H.G. (Australian Atomic Energy Commission Research Establishment, Lucas Heights). Nov 1982. 20p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702512.

A project has been initiated to investigate simple but effective ion implantation and pulsed annealing techniques for the fabrication of high efficiency silicon solar cells. In particular, the method aims to eliminate the mass analyser and associated components from the implanter. A solid feed source is used in a clean ultra high vacuum environment to minimise impurities.

48799 (AD-A—129165/7) **Implementation of a Biomass Energy Island for a forested Air Force installation. Final report Mar 82-Jan 83.** Huff, W.J.; McConnell, W.V.; Steadman, P.E. (Ultrasystems, Inc., Fairfax, VA (USA); Air Force Engineering and Services Center, Tyndall AFB, FL (USA). Engineering and Services Lab.). Jan 1983. 69p. NTIS, PC A04/MF A01.

This study examines the silvicultural practices, harvesting methodology and managerial techniques pertinent to the operation of Choctawhatchee sand pine (CSP) plantations on Eglin AFB to establish Eglin as a Biomass Energy Island (BEI). Previous studies have demonstrated: (1) the feasibility of using wood grown on selected Air Force installations as the fuel to supply the energy requirements of each; and (2) the specific adaptability of Eglin AFB as a Biomass Energy Island (BEI). As such, Eglin would satisfy all energy needs of the facility by using 540,000 green tons of wood chips harvested from 90,000 acres of on-base energy plantations to fuel a gasification/combined cycle conversion system. This study concludes: the technology of biomass conversion is appropriate for Eglin; both gasification and direct combustion cogeneration should be used for comparison purposes initially in the light of changing requirements; and the management of wood fuel plantations at Eglin and the phased establishment of the base as a BEI is both economically and technically sound and desirable.

48800 (BMFT-FB-T—83-043) **Schottky- and MIS-type amorphous-silicon solar cells.** Milleville, M.; Leidich, D.; Niemann, E.; Fischer, R. (Bundesministerium fuer Forschung und Technologie, Bonn (Germany, F.R.)). Apr 1983. 62p. (In German). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83751093.

Thin films of hydrogenated amorphous silicon were prepared by reactive plasma deposition in a high-frequency glow discharge of silane. Structural, electrical and optical properties of these films were investigated in order to ensure that they had the quality required for the fabrication of solar cells. Two types of solar cell structures were prepared, Schottky barrier cells and MIS cells having a thin insulating layer of SiOsub(x). The cells were optimized with respect to type and sheet resistance of the substrate, thickness of the active layer, and thickness of the insulating layer.

48801 (CONF-830222—) **Proceedings of the US Department of Energy Photovoltaics Program annual review.** (Jet Propulsion Lab., Pasadena, CA (USA)). 1983. Contract AM03-76SF00767. 397p. NTIS, PC A17/MF A01. Order Number DE83010325.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

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One paper was separately abstracted and 19 brief summaries of presentations given at this meeting were indexed. Also included in the proceedings but not indexed are introductory speeches and presentations consisting of viewgraphs only. (LEW)

48802 (CONF-830222—, pp 59-62) **Photovoltaic markets.** Maycock, P. (Photovoltaic Energy Systems, Inc., Alexandria, VA). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48803 (CONF-830222—, pp 65-66) **Status and potential of thin-film collectors: a production industry perspective.** Berman, E. (ARCO Solar, Inc., Woodland Hills, CA). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48804 (CONF-830222—, pp 67-72) **Thin film solar cell R & D needs.** Gintz, J.R. (Boeing Engineering and Construction Co., Seattle, WA). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48805 (CONF-830222—, pp 91) **Potential for solar cell technology in the year 2000.** Cody, G.D.; Tiedje, T. (Exxon Research and Engineering Co., Linden, NJ). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48806 (CONF-830222—, pp 99-108) **Silicon ribbon for photovoltaics-current status and future prospects.** Ravi, K.V. (Mobil Solar Energy Corp., Waltham, MA). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48807 (CONF-830222—, pp 109-116) **Crystalline silicon: a potential for very long life.** Ross, R. (Jet Propulsion Lab., Pasadena, CA). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48808 (CONF-830222—, pp 117-131) **Efficiency improvement in silicon solar cells.** Wolf, M. (Univ. of Pennsylvania, Philadelphia). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48809 (CONF-830222—, pp 133-144) **High-efficiency, low-cost tandem cells.** Fan, J.C.C. (Massachusetts Inst. of Tech., Lexington). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48810 (CONF-830222—, pp 145-147) **Monolithic two color three terminal solar cells.** Fraas, L.M. (Chevron Research Co., Richmond, CA). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48811 (CONF-830222—, pp 149-158) **Status of high efficiency concentrator solar modules at Varian.** Ludowise, M.J.; Kaminar, N. (Varian Associates, Inc., Palo Alto, CA). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48812 (CONF-830222—, pp 159-169) **PV concentrator research status.** Maish, A.B. (Sandia National Labs., Albuquerque, NM). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48813 (CONF-830222—, pp 265-270) **PV R & D recommendations: summary of the solar R & D panel of the Energy Research Advisory Board.** Little, R.G. (Spire Corp., Bedford, MA). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48814 (CONF-830222—, pp 271-272) **Industry views of the federal role/DOE response: ARCO Solar's perspective of the federal role.** Berman, E. (ARCO Solar, Inc., Woodland Hills, CA). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48815 (CONF-830222—, pp 283) **Abstract of remarks by V.W. Weekman at panel session on industry views of the federal role in photovoltaics.** Weekman, V.W. (Mobil Solar Energy Corp., Waltham, MA). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48816 **(DFE—59) Energy research program 1978/79-1980/81. Surveying the performance of the line wood-pulp-paper.** Larsen, H.; Olsson, P. (Delegationen foer Energiforskning, Stockholm (Sweden)). Apr 1982. 68p. (In Swedish). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83750981.

The research program of the Swedish government acts in the developmental stage. A number of projects have started which may reduce the use of energy in the pulp industry. Most of the grants have been allocated to the Forest Products Research Laboratory. The report has the character of a preliminary study with a general view over the total branch, and it tries to show how the various energy conservation efforts have been distributed.

48817 **(DOE/ER/10961—1) Fourth international conference on photochemical conversion and storage of solar energy.** (Hebrew Univ., Jerusalem (Israel)). 1982. Contract FG02-81ER10961. 351p. (CONF-8208106—Absts.). NTIS, PC A16/MF A01. Order Number DE83014760.

From 4. international conference on photochemical conversion and storage of solar energy; Jerusalem, Israel (8 Aug 1982).

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Abstracts of 123 papers are included under the following topics: conversion of sunlight into electrical power and photoassisted electrolysis at semiconductor electrodes; photosensitized reactions on surfaces; the role of porphyrins and chlorophylls in artificial photosynthesis; oxidation reduction photochemistry in homogeneous solutions; photoelectron transfer in organized assemblies; photogalvanic cells and effects; elementary processes in catalytic reactions at the interface between colloidal microelectrodes and solutions; and luminescent solar collectors and concentrators. Author and subject indexes are included.

48818 **(DOE/JPL—1012-81) Proceedings of the flat-plate solar-array workshop on the science of silicon-material preparation.** (Jet Propulsion Lab., Pasadena, CA (USA)). 1 Feb 1983. Contract AI01-76ET20356. 314p. (CONF-820879—). NTIS, PC A14/MF A01. Order Number DE83011241.

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

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Separate abstracts were prepared for 21 papers in this workshop proceedings. (LEW)

48819 (DOE/JPL—1012-81, pp 5-15) **Silicon challenge.** Lorenz, J.H. (Union Carbide Corp., Danbury, CT). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

Silicon material preparation is discussed, including a brief history of the production of pure polysilicon, a status review of the Union Carbide contract programs and current commercial program, and the future needs of polysilicon. (LEW)

48820 (DOE/JPL—1012-81, pp 17-30) **Silicon purity: impact on crystal growth and silicon properties for photovoltaic applications.** Hopkins, R.H.; Davis, J.R.; Rohatgi, A. (Westinghouse R and D Center, Pittsburgh, PA). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

Many differing cell designs, fabrication technologies, and crystallization methods are used to produce today's silicon solar cells. Each approach varies in its sensitivity to the purity of the silicon feedstock, making the specification of a universal solar grade of silicon elusive. In this article we review how silicon sheet or wafer preparation technology and thermal history influence the relationships between device performance and feedstock purity. We conclude that a range of silicon purity requirements exists for cost-effective manufacturing depending on the overall process sequence employed.

48821 (DOE/JPL—1012-81, pp 33-50) **Chlorosilane thermodynamic equilibria calculations with applications to high purity silicon preparation.** Erk, H.F. (Monsanto Co., St. Peters, MO). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

The present work deals with the development of user-friendly computer programs which rapidly perform equilibria calculations for the Si-Cl-H system. The programs are used with a variety of thermodynamic data to calculate equilibrium composition, silicon to chlorine ratios (Si/Cl), equilibrium yields (eta), at different temperatures, pressures and chlorine to hydrogen ratios (Cl/H). One objective of this work is to illustrate the importance of and the need for accurate thermodynamic data for the chlorosilanes, particularly $SiCl_4$, $SiHCl_3$, $SiCl_2$, and SiH_2Cl_2. By introducing small errors in the standard heat of formation of trichlorosilane [similar to the treatment performed by Hunt and Sirtl], large errors appear in the molar ratio of $SiHCl_3$ to $SiCl_4$, as well as significant errors in Si/Cl (or yield), and molar ratio of $SiCl_2$ to $SiCl_4$. A second objective is to apply these calculations to three important processes: the production of trichlorosilane in a fluidized bed of silicon, the production of polysilicon from trichlorosilane in a high pressure Siemens decomposer, and the production of silicon from trichlorosilane in a fluidized bed reactor. Comparisons of equilibrium calculations with patent literature data for each of these processes provides insight into the closeness of the individual process to chemical equilibrium.

48822 (DOE/JPL—1012-81, pp 51-61) **Kinetics and mechanisms of chlorosilane decomposition.** Bailey, D.L. 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

Chlorosilanes containing the elements silicon, hydrogen and chlorine are important intermediates in the manufacture of silicone products and in the production of high purity polycrystalline silicon for the electronics industry. A wealth of information exists for chemical processes which either are used to prepare chlorosilanes or to convert them into silicon chemicals containing carbon-silicon bonds. These include the reaction of hydrogen chloride with silicon to give trichlorosilane and the addition of trichlorosilane (or dichlorosilane) to olefinic compounds to produce organic substituted chlorosilanes. In the temperature range that such reactions occur (300 to 700°K) thermal decompositions of chlorosilanes are relatively slow. The kinetics and mechanisms for such decompositions have been investigated only qualitatively. High temperature decompositions of chlorosilanes where silicon is a major product take place rapidly with the result that conclusions drawn have been based on thermodynamics and physical considerations such as surface area and diffusion rather than on the chemical steps involved. While this treatment has been quite helpful in defining the silicon-hydrogen-chlorine system it seemed desirable to review both high and low temperature chlorosilane decompositions including those where catalysts are employed. This presentation will provide an overview of chlorosilane reactions with the objective of pointing out their implications in the production of polycrystalline silicon metal.

48823 (DOE/JPL—1012-81, pp 63-74) **Kinetics and mechanism of the silane decomposition.** Ring, M.A.; O'Neal, H.E. (San Diego State Univ., CA). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

The thermal decomposition of silane in static and flow systems (T = 400 to 600°C) progresses through several stages of changing rates, changing reaction orders, and varying products. In the initial stages (0 to 3%) the reaction follows 3/2 order kinetics and the principal products are H_2 and Si_2H_6, trisilane is also formed at rates roughly an order of magnitude lower than those for disilane. In later stages (5% and up), reaction rates become faster by factors of 3 to 5, the products produced are mainly H_2 and solid polymer, and reaction orders have been reported as 1.0 (400°C, static system), 1.5 (485°C to 530°C, flow) and 0.75 (530 to 589°C, flow). Clearly the reaction is very complex and we are far from understanding it in any kind of detail. However, correlation of data from prior studies with data of several recent studies in our laboratories (single pulse shock tube pyrolysis, and our static system pyrolyses in the presence and absence of additives), has aided in the identification of the reactions and intermediates involved in the two reaction stages. The purpose of this paper is to present our current thoughts on the silane pyrolysis system in both reaction stages.

48824 (DOE/JPL—1012-81, pp 79-88) **Homogeneous gas-phase condensation of silicon by shock wave induced decomposition of SiH_4.** Steinwandel, J. (Yale Univ., New Haven, CT); Dietz, T.; Hoeschele, J.; Hauser, M. 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

The gas phase condensation of silicon was studied using a membrane shock tube. Supersaturated silicon vapors were generated by thermal decomposition of SiH_4 in strong shock waves. The initial compound concentration in the shock wave carrier gas argon ($n/sub\ SiH_4/ < 5.10^{15}\ cm^{-3}$) was sufficiently low for the ideal shock tube operation equations to hold and isothermal reaction conditions to prevail during the phase transition. In varying shock wave temperatures and initial compound concentration in the carrier gas, various supersaturated states of atomic silicon vapor were produced in the region between incident and reflected shock waves. The vapor condensed to form small silicon clusters with a maximum size of about 50 A during the undisturbed observation time of 2 msec. The rate of formation of the clusters was detected using atomic (SiI) and molecular (Si_2) spectroscopy and dynamical extinction measurements (Si-clusters) respectively. Our experimental data cannot be described by the classical theory of homogeneous nucleation; we have instead used a simple kinetic model based on classical collision theory assuming a constant number of growing particles. Due to the spectroscopic identification of the Si_2-molecule, we assume this number to be the equilibrium concentration of the molecule.

48825 (DOE/JPL—1012-81, pp 89-100) **Kinetics of particle growth in silane systems.** Dickson, C.R.; Felder, W. (AeroChem Research Labs., Inc., Princeton, NJ). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

The objective of this exploratory work was to provide kinetic and mechanistic information on the formation and growth of silicon particles arising from the pyrolysis of silane (SiH_4) gas. Experiments were carried out in heated, dilute, flowing mixtures of SiH_4 in Ar to determine the sizes and rates of growth of silicon particles, the rates of growth of silicon seed particles, the amount of SiH_4 decomposed, and the number of particles formed. Thus, the studies

encompassed the homogeneous decomposition of SiH_4, gas-surface interactions, and particle growth phenomena. Detailed investigations of these processes were not intended; rather, an overview of the mechanisms and the time and temperature dependences were sought. The work reported here also was aimed at demonstrating the utility of the flow tube method for providing kinetic information on gas particle systems.

48826 (DOE/JPL—1012-81, pp 107-120) **Factors governing particle size in the free space reactor.** Flagan, R.C.; Alam, M.K. (California Inst. of Tech., Pasadena). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

A theoretical study of silicon aerosol formation in entrained flow reactors has been undertaken in order to elucidate those factors which limit particle growth in such systems, and to identify alternate approaches which are capable of generating larger particles by pyrolysis of silane gas. The roles of nucleation, coagulation, and heterogeneous condensation in the growth of particles in the free space reactor are reviewed. (LEW)

48827 (DOE/JPL—1012-81, pp 199-228) **Reactor models for CVD of silicon.** Dudukovic, M.P. (Washington Univ., St. Louis, MO). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

This paper reviews the currently used reactor models for CVD of silicon and the key features of the thermodynamics and kinetics of the Si-H and Si-H-Cl system. A simple model for bell-jar decomposers is suggested and some problems related to fluidized bed modeling outlined.

48828 (DOE/JPL—1012-81, pp 229-239) **Deposition of low defect density amorphous semiconductors by homogeneous chemical vapor deposition.** Scott, B.A.; Meyerson, B.S.; Reimer, J.A.; Wolford, D.J.; Plecenik, R.M. (I.B.M. Thomas J. Watson Research Center, Yorktown Heights, NY). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

An experiment to prepare a-Si:H from a silane plasma by homogeneous chemical vapor deposition is described, including kinetic studies and a discussion of the gas phase and surface reaction chemistry. (LEW)

48829 (DOE/JPL—1012-81, pp 241-252) **Mechanisms in plasma enhanced deposition of silicon.** Sarma, K.R. (Solavolt International, Phoenix, AZ). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

Polycrystalline silicon ribbons have been deposited by a high pressure plasma (HPP) enhanced deposition process. The HPP deposition process has been characterized for the silicon sources SiH, SiH_2Cl_2, $SiHCl_3$ and $SiCl_4$ under a variety of process parameters to determine the depostion mechanisms. The observed results were discussed in terms of thermodynamics, silicon deposition modes, and kinetic and mass transport processes for gaseous and particle species. Possible mechanisms responsible for deposition enhancement by HPP compared to a conventional CVD process have been presented.

48830 (DOE/JPL—1012-81, pp 253-264) **Chemical vapor deposition of epitaxial silicon.** Reif, R. (Massachusetts Inst. of Tech., Cambridge). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

This paper reviews the Chemical Vapor Deposition of epitaxial silicon under steady-state and transient conditions. This review will cover the incorporation of arsenic and phosphorus during silicon epitaxial growth, and the transients associated with the establishment of a steady-state silicon deposition process. A physical-chemical model that simulates the behavior of an epitaxial reactor under a variety of transient and steady-state conditions is also discussed.

48831 (DOE/JPL—1012-81, pp 293-304) **Hemlock semiconductor dichlorosilane-based C.V.D. process.** McCormick, J.R. (Hemlock Semiconductor Corp., MI). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

The current polycrystalline silicon manufacturing process is briefly reviewed in this paper. Key features of an improved process, Hemlock Semiconductor Corporation's (HSC) Dichlorosilane (DCS) Based CVD Process, are presented along with a general process description. Process development efforts on the dichlorosilane based CVD process have been pursued with JPL/DOE support since 1979 and considerable data relating to all aspects of the technology have been developed. This paper will concentrate, in addition to the overall process description, on three key research areas: (1) the hazardous properties of dichlorosilane; (2) catalyst evaluation for the redistribution of trichlorosilane; and (3) chemical vapor deposition of polycrystalline silicon from dichlorosilane feedstock.

48832 (DOE/JPL—1012-81, pp 305-315) **Production of silicon by the reduction of silicon tetrafluoride with sodium.** Sanjurjo, A.; Sancier, K. (SRI International, Menlo Park, CA). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

Solar grade silicon can be prepared by reducing SiF_4 gas with Na metal to form Si and NaF. The SiF_4 is obtained from inexpensive H_2SiF_6 by precipitation and decomposition of Na_2SiF_6. The product Si can be separated from NaF by aqueous leaching or by melting above 1450°C.

48833 (DOE/JPL/954334—21) **Experimental process-system development unit for producing semiconductor-grade silicon using the silane-to-silicon process. Flat-plate solar-array project. Phase III final report, April 1979-December 1981.** (Jet Propulsion Lab., Pasadena, CA (USA)). 1981. Contract NAS-7-100-954334. 354p. NTIS, PC A16/MF A01. Order Number DE83013712.

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The objective of Phase III for the establishment of the practicality of a process producing semiconductor-grade silicon by a two-step process, the preparation of silane and the subsequent pyrolysis of silane to yield high-purity silicon, was (1) the detailed engineering design, fabrication, installation, checkout, and operation of an Experimental Process System Development Unit (EPSDU), (2) the performance of a supporting research and development program to provide an information and quality control base usable for the EPSDU and for technological design and economic analyses for potential scale-up of the process, and (3) the performance of iterative economic analyses of the estimated product cost and of large-scale plant cost for production of semiconductor-grade silicon in a EPSDU capable of 100 metric tons of silicon per year.

48834 (DOE/JPL/955902—83/10) **Process research on polycrystalline-silicon material (PROPSM). Quarterly report No. 10, April 1, 1983 - June 30, 1983.** Culik, J.S. (Solarex Corp., Rockville, MD (USA)). 1983. Contract NAS-7-100-955902. 60p. NTIS, PC A04/MF A01. Order Number DE83016820.

The investigation of the performance-limiting mechanisms in large-grain (greater than 1 to 2 mm in diameter) polycrystalline silicon was continued by measuring the illuminated current-voltage (I-V) characteristics of the mini-cell wafer set. Low average values of open-circuit voltage and a great degree of open-circuit voltage and fill-factor scatter were correlated with the presence of inclusions, which was also correlated with significantly greater values of shunt conductance. Therefore, the scatter in the open-circuit voltage, fill-factor and power of solar cells presently fabricated from cast large-grain polycrystalline silicon is due, to some extent, to inclusions,

which act as resistive shunts. However, this defect is not intrinsic since a number of polycrystalline wafers shown no indication of excessive shunt conductance or the presence of inclusions. Two processes, gettering and hydrogenation, are being investigated for improving the performance of polycrystalline silicon. Several experiments were performed to evaluate the usefulness of a 1000°C backside damage-gettering heat treatment for removing minority-carrier lifetime-killing impurities. At present, no improvement in minority-carrier lifetime has been observed. The photoconductivity decay time of the polycrystalline silicon wafers was systematically and significantly degraded by longer heat-treatments at 1000°C. There appears to be a minority-carrier lifetime-killing mechanism in polycrystalline silicon that is activated by the high temperatures employed in this particular damage-gettering heat treatment. A system for DC plasma hydrogenation of 2 cm x 2 cm samples is being refurbished to investigate grain and subgrain boundary passivation.

48835 (IA—1375, pp 96) **Cadmium telluride for solar cells.** Goffer, Z. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

48836 (NP—3770319) **Electricity from photovoltaic systems.** (Bundesverband Solarenergie, Essen (Germany, F.R.)). Dec 1981. 13p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83770319.

This informatory brochure published by BSE describes the fields of application for photovoltaics and the delivery possibilities of BSE member-companies. Detailed information is available from BSE or its member-companies.

48837 (PB—83-175646) **Establishing intensively cultured hybrid poplar plantations for fuel and fiber. Forest Service general technical report (final).** Hansen, E.; Moore, L.; Netzer, D.; Ostry, M.; Phipps, H. (North Central Forest Experiment Station, St. Paul, MN (USA)). 4 Mar 1983. 31p. (FSGTR-NC—78). NTIS, PC A03/MF A01.

This paper describes a step-by-step procedure for establishing commercial size intensively cultured plantations of hybrid poplar and summarizes the state-of-knowledge as developed during 10 years of field research at Rhinelander, Wisconsin.

48838 (PB—83-198887) **Construction of a photovoltaic cell based on the photoelectrochemistry of organic dyes at transparent semi-conducting electrodes. Final report.** Nasielski, J.; Kirsch-de Mesmaeker, A. (Commission of the European Communities, Luxembourg). [nd]. 100p. (EUR—7795-EN). NTIS, PC A05/MF E05.

The aim of the study was to establish the photoelectrochemical mechanisms of different dye-reducing systems at transparent semiconducting bubbling gas electrodes and to predict the parameters for optimising the cell operation and its output. The photoelectrochemical methods were also applied to the analysis of other dye-reducing systems as candidates for novel photogalvanic cells. 'Adsorbed type' as well as 'solution type' dyes were chosen, viz, three triphenylmethanes (methyl violet, crystal violet and malachite green) and the erythrosine-hydroquinone couple. The results obtained are analysed and presented in the form of tables and graphs.

48839 (PB—83-217778) **Sampling program on below-ground biomass and productivity in four salt marsh vegetation stands.** Vink-Lievaart, M.A. (Delta Inst. for Hydrobiological Research, Yerseke (Netherlands)). 1983. 42p. (In Dutch). NTIS, PC A03/MF A01.

During 1979 and 1980 a sampling programme was performed on the below-ground biomass and productivity in four salt marsh vegetation stands. Three of the stands were monospecific, comprising: Elytrigia pungens, Halimione portulacoides and Spartina anglica, and one was multispecific with Triglochin maritima (90%), Limonium vulgare (5%) and Puccinellia maritima (5%). The variations of the below-ground biomass during the period of investigation did show a good fit to the hypothetical predictions for the below-ground biomass fluctuations throughout the year. This gives support to the reliability of the obtained biomass data. As a result of the relatively high biomass figures, below-ground production is also higher than that reported from comparable plant species or vegetation types.

48840 (SAND—83-0604) **Tenth photovoltaic concentrator project integration meeting, Albuquerque, New Mexico, April 6 & 7, 1983.** Boes, E. (Sandia National Labs., Albuquerque, NM (USA)). Apr 1983. Contract AC04-76DP00789. 277p. (CONF-830477—). NTIS, PC A13/MF A01. Order Number DE83012338.

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

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This report is the Proceedings for a meeting on photovoltaic concentrator technology held at Albuquerque, NM in April 1983. The meeting covered research on photovoltaic concentrators and their components, including concentrator cells, cell assemblies and receivers, fresnel lenses, concentrator modules, tracking structures and control systems, and complete concentrator arrays. This report contains abstracts and summaries of presentations made at the meeting and status reports for current research contracts in this area. Four reports are individually abstracted, and 48 brief summaries are title-listed.

48841 (SAND—83-0604, pp 12-15) **Concentrator photovoltaic technology support.** Herwig, L.O. (Dept. of Energy, Washington, DC). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48842 (SAND—83-0604, pp 16-23) **Concentrator project news.** Boes, E.C. (Sandia National Labs., Albuquerque, NM). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48843 (SAND—83-0604, pp 24-27) **EPRI perspective on PV concentrators.** Taylor, R.W. (Electric Power Research Institute, Palo Alto, CA). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48844 (SAND—83-0604, pp 33-37) **Concentrator module and array status.** Edenburn, M.W. (Sandia National Labs., Albuquerque, NM). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48845 (SAND—83-0604, pp 38-48) **Passively cooled and actively cooled linear Fresnel lens photovoltaic concentrators.** O'Neill, M.J. (E-Systems, Inc., Dallas, TX). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48846 (SAND—83-0604, pp 49-58) **MMC 2nd generation module performance analysis.** King, D.L.; Chiang, C.J. (Sandia National Labs., Albuquerque, NM). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

Performance measurements are briefly summarized for a photovoltaic concentrator module. Measurements included lens efficiency, series resistance, nonuniform illumination, cell mismatch, and cell degradation. Efficiency loss mechanisms are also summarized. (LEW)

48847 (SAND—83-0604, pp 59-68) **Development, fabrication and performance improvement of current baseline concentrating photovoltaic converters.** Broadbent, S. (Intersol Power Corp., Lakewood, CO). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48848 (SAND—83-0604, pp 69-73) **Point focus concentrator module improvement.** Hein, R.E. (Martin Marietta Denver Aerospace, CO). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48849 (SAND—83-0604, pp 74-83) **Development of a third-generation linear Fresnel lens passively cooled photovoltaic collector.** McDanal, A.J. (E-Systems, Inc., Dallas, TX). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48850 (SAND—83-0604, pp 84-88) **Sandia baseline module II.** Chiang, C.; Cannon, J.; Beavis, L. (Sandia National Labs., Albuquerque, NM). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48851 (SAND—83-0604, pp 90-104) **Development of the Sandia 200X experimental baseline module.** Arvizu, D.E. (Sandia National Labs., Albuquerque, NM). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

The development of a concentrator solar cell module included a computer modelling investigation addressing cell size, cell thickness, and grid line size and spacing the three important cell parameters that affect series resistance. The optical design calls for a flat grooved flat Fresnel lens with antireflection coating. Initial test results are given. (LEW)

48852 (SAND—83-0604, pp 105-111) **1000X GaAs module and new integral backplane design.** Kaminar, N. (Varian Associates, Inc., Palo Alto, CA). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48853 (SAND—83-0604, pp 112-117) **PASTF measurement experience.** Gerwin, H.J. (Sandia National Labs., Albuquerque, NM). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48854 (SAND—83-0604, pp 118-126) **GE baseline module and array performance.** Maish, A. (Sandia National Labs., Albuquerque, NM). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48855 (SAND—83-0604, pp 127-137) **Status of concentrator cell encapsulation and lay down.** Beavis, L.C.; Cannon, J.E. (Sandia National Labs., Albuquerque, NM). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48856 (SAND—83-0604, pp 138-145) **Sandia stand-alone concentrator array II.** Maish, A. (Sandia National Labs., Albuquerque, NM). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48857 (SAND—83-0604, pp 146) **Concentrator cell research overview.** Arvizu, D.E. (Sandia National Labs., Albuquerque, NM). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48858 (SAND—83-0604, pp 147-154) **Sandia Si concentrator cell research.** Rose, B.H. (Sandia National Labs., Albuquerque, NM). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48859 (SAND—83-0604, pp 155-159) **Design, fabrication, and testing of silicon cells with high efficiency at high insolation levels (≧ 200 suns).** Ho, F. (Applied Solar Energy Corp., City of Industry, CA). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48860 (SAND—83-0604, pp 160-162) **Concentrator cell evaluation program.** Backus, C.E. (Arizona State Univ., Tempe). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48861 (SAND—83-0604, pp 163-169) **Concentrator solar cell manufacturing and packaging development.** Meyer, J.; Yoon, S. (M/A-COM PHI, Inc., Torrance, CA). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48862 (SAND—83-0604, pp 170) **SERI's advanced high efficiency concepts task.** Cole, L. (Solar Energy Research Inst., Golden, CO). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48863 (SAND—83-0604, pp 172-174) **Advanced cell research at Varian.** Bell, R.L. (Varian Associates, Inc., Palo Alto, CA). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48864 (SAND—83-0604, pp 176-191) **Annual performance analysis of series and independently connected AlGaAs/silicon stacked cells.** King, D.L.; Siegel, R.B. (Sandia National Labs., Albuquerque, NM). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

The intent of the work presented was to determine the influence on annual cell performance of continuously changing atmospheric parameters (air mass, precipitable water, turbidity). Determining the annual penalty in performance that would result from series versus independent electrical connection of the different bandgap cells was of particular interest. A mechanically stacked AlGaAs on Si configuration was used. The stacked cell is described, and an atmospheric transmittance model required to continuously vary the solar spectral irradiance with time of day is discussed. Besides the solar irradiance model, there is a cell performance model and annual performance model. The optimum AlGaAs bandgap was fixed at an optimum value of approximately 1.75 eV. (LEW)

48865 (SAND—83-0604, pp 232A-232B) **Linear Fresnel lens photovoltaic concentrator program.** Rafinejad, D. (Acurex Solar Corp., Mountain View, CA). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48866 (SAND—83-0604, pp 233-234) **Cell substrate bonding research.** Schwinkendorf, W.E. (BDM Corp., Albuquerque, NM). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48867 (SAND—83-0604, pp 235-236) **Thin-film barriers.** Nicolet, M.A. (California Inst. of Tech., Pasadena). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48868 (SAND—83-0604, pp 237) **Development of actively cooled linear Fresnel lens photovoltaic receivers using dendritic web solar cells.** O'Neill, M.J. (E-Systems, Inc., Dallas, TX). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48869 (SAND—83-0604, pp 238-239) **Development of a stand-alone linear Fresnel lens photovoltaic collector array.** Waller, R.A. (E-Systems, Inc., Dallas, TX). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48870 (SAND—83-0604, pp 240-241) **Development of an advanced linear Fresnel lens photovoltaic and thermal concentrator module.** McDanal, A.J. (E-Systems, Inc., Dallas, TX). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48871 (SAND—83-0604, pp 242-243) **Development of a low-cost, passively cooled linear Fresnel lens photovoltaic concentrator module.** McDanal, A.J. (E-Systems, Inc., Dallas, TX). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48872 (SAND—83-0604, pp 244-245) **Development of a second-generation linear Fresnel lens photovoltaic concentrator array.** O'Neill, M.J. (E-Systems, Inc., Dallas, TX). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48873 (SAND—83-0604, pp 246) **Development and fabrication of a 22 kilowatt photovoltaic and thermal concentrator array.** O'Neill, M.J. (E-Systems, Inc., Dallas, TX). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48874 (SAND—83-0604, pp 247) **Development of a low-cost extrusion/embossing process for a linear Fresnel lens photovoltaic concentrator.** Waller, R.A. (E-Systems, Inc., Dallas, TX). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48875 (SAND—83-0604, pp 248-249) **Fabrication of point-focus concentrating photovoltaic building block arrays.** Stegeman, R.E. (Intersol Power Corp., Lakewood, CO). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48876 (SAND—83-0604, pp 250) **Development and fabrication of photovoltaic concentrator modules for a point-focus Fresnel array.** Broadbent, S. (Intersol Power Corp., Lakewood, CO). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48877 (SAND—83-0604, pp 251-252) **Improving the performance of current baseline concentrating photovoltaic converters.** Broadbent, S. (Intersol Power Corp., Lakewood, CO). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48878 (SAND—83-0604, pp 253) **Fresnel lens modeling.** James, L.W. (L.W. James and Associates, Fort Collins, CO). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48879 (SAND—83-0604, pp 254-255) **Etched multiple vertical junction (EMVJ) cell development.** Goodrich, J. Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48880 (SAND—83-0604, pp 256) **Si concentrator cell development.** Yoon, S.; Meyer, J. (M/A-COM PHI Inc., Torrance, CA). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48881 (SAND—83-0604, pp 257-258) **Development of a production fabrication process sequence for silicon concentrator solar cells.** Taylor, W.E. (Photowatt International, Inc., Tempe, AZ). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48882 (SAND—83-0604, pp 259) **Design and development of laminated Fresnel lens parquets for point focus PV systems.** Baum, B. (Springborn Labs., Inc., Enfield, CT). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48883 (SAND—83-0604, pp 260) **High intensity solar cells.** Schwartz, R.J. (Purdue Univ., West Lafayette, IN). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48884 (SAND—83-0604, pp 261-265) **Thin parquets of point focus Fresnel lenses.** Cobb, S. (3M Industrial Optics, St. Paul, MN). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

Thin Linear Fresnel Lenses suitable for lamination to a supporting superstrate have been made by 3M Industrial Optics for Linear Photovolaic Concentrators; for both contractors to Sandia National Labs., and commercial applications. These have shown excellent performance, very near the theoretical maximum, attesting to the high degree of replication of the individual Fresnel prisms, as has been previously reported by E-Systems and Acurex. This contract deals with the progress in adapting the concepts to producing parquets of point focus lenses. The current contract with SNL is to make a parquet of Annular Fresnel Lenses in thin film form (.020" to .025"). The guideline is to use the Strawman format as the di-

mensional target; however determination of inherent dimensional changes is one of the objectives of the program. Tasks required for completion of the contract include lens design and analysis, tooling fabrication, process adaptation, manufacture of material, and fabrication into the 30 lens (6 x 5) format. It should be noted that the contract was undertaken with the understanding that many phases of the processing are proprietary to 3M, and that in those cases, only the results would be discussed. The current status of the project is that the final lens parquets have been delivered and await testing in both individual lens and parquet form. Key results to date regarding lens design, manufacturing, and properties are discussed.

48885 (SAND—83-0604, pp 266) **Design of a high-concentration, passively-cooled, low-cost GaAs concentrator module.** Kaminar, N. (Varian Associates, Inc., Palo Alto, CA). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48886 (SAND—83-0604, pp 267) **Development of mechanically-stacked concentrator cell.** Ludowise, M.J. (Varian Associates, Inc., Palo Alto, CA). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48887 (SAND—83-0604, pp 268) **Development of an integral backplane concentrator module.** Kaminar, N. (Varian Associates, Inc., Palo Alto, CA). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48888 (SERI/CP—231-1924, pp 63-68) **Biomass electrochemistry.** Chum, H.L. (Solar Energy Research Inst., Golden, CO). Mar 1983. NTIS, PC A06/MF A01. (CONF-821249—).

From SERI anaerobic digestion program review meeting on fuel gas production from animal and agricultural residues and biomass; Golden, CO, USA (6 Dec 1982).

The objectives are to select the biomass-derived substrates which can benefit from electrochemical processing, and to experimentally show the usefulness of the electrochemical reactions. The substrates selected are: (1) lignin materials derived from a variety of pretreatments, e.g., the steam explosion of aspen (Populus tremuloides), a low value, fast growing hardwood; other lignin materials under consideration are aspen lignin from organosolv pretreatment, from anaerobic digestion, from kraft pulping, and ball-milled aspen lignin (reference material); (2) carboxylic acids derived from the methane-suppressed anaerobic digestion of cellulosic and hemicellulosic materials; (3) waste streams of biomass processing, e.g., from acid hydrolysis, fermentation processes, alkaline pretreatment. We have completed the functional group characterization, infrared spectroscopy, ^{1}H and ^{13}C nuclear magnetic resonance analyses and molecular weight distribution of the ethanol-extracted explosively-depressurized aspen lignin (EEEDAL). We have submitted EEEDAL to electrolysis at constant potential -2.6 V vs Ag/Ag/AgCl reference electrode in methanol on mercury cathodes and observed the reduction of carbonyl groups as well as cleavage of side chains in the lignin molecules. The reduced materials have been characterized. We have succeeded in varying the pH of the electrolyses and are assessing its effect on the properties of the polymer. We have set-up an electrolyses polypropylene parallel plate flow-cell using batch recycle, with a gas collection set-up for GC analysis for electrolyses of valeric acid on carbon anodes. Both gaseous and liquid products are being analyzed. The major gaseous product is butene-1. Photoelectrochemical reactions of lactic (2-hydroxypropionic) acid on undoped and doped platinized anatase and other semiconductor powders have been investigated to treat waste streams of cellulose alkaline regeneration plants.

48889 (SERI/CP—231-1924, pp 69-74) **Agricultural residue to diesel fuel R and D task.** Humphrey, M.F. (Jet Propulsion Lab., Pasadena, CA). Mar 1983. NTIS, PC A06/MF A01. (CONF-821249—).

From SERI anaerobic digestion program review meeting on fuel gas production from animal and agricultural residues and biomass; Golden, CO, USA (6 Dec 1982).

The objective of this effort is to provide bench-scale testing of agricultural residue hydrolysis process designed to produce aliphatic compounds and fuel substitutes. The research is designed to verify the processing concept and to optimize design parameters. Since the last reporting period, two first- and second-stage hydrolysis runs were made in the glass laboratory equipment with Hawaiian bagasse. These runs were made to examine the effect of the acid catalyst concentration on the products of the reactions. Results indicated that the production of furfural in the first-stage hydrolysis is sensitive to the acid concentration, the time of reaction and the maximum temperature reached. Product from the 5% acid hydrolysis consisted of the following: methanol - 2.2%; ethanol - 1.8%; N butanol - 3.1%; acetic acid - 53.4%; furfural 35.1%; propionic acid - 3.1%; and butyric acid - 1.3%. Controlling the acid concentration in the first-stage hydrolysis appears more important than temperature in determining the produced components. Second-stage hydrolysis runs (bottoming cycle) using 14.5% and 17.5% acid concentrations on the residues from the first stage reactions, produced sugar solutions of less than 1% concentrations. The laboratory glass equipment was re-examined for ways to allow the attainment of the higher reaction temperatures that are required for the second-stage hydrolysis. It was decided to modify the existing metal tube reactor to use higher pressure steam. A fermentation plan was produced. This plan makes use of a single strain of Clostridia (CL Acetobutylicum) to study the bioproduction of butanol. A study was made of various solvents and their extractive abilities for furfural. Future plans are discussed. (DMC)

48890 **Measurements for commercial photovoltaics: A status report.** Schafft, H.A. *Solar Cells;* 7: No. 1/2, 23-46(Nov 1982). (CONF-810748—).

From Commercial photovoltaics measurements workshop; Vail, CO, USA (27 Jul 1981).

The first part of this report discusses how reliable measurements play an important role along the chain of supplier-user links that make up the photovoltaics industry and its customers. Such measurements provide accurate information on materials, fabrication processes, product charcterization and product needs on which sound decisions can be made to optimize the performance of processes and products. They are also indispensable for effective communication in the marketplace. The second part reviews the results of visits to industry to identify measurements-related issues that affect the expeditious development and application of photovoltaics. The third part of the report provides an overview of measurement and standards development activities. The intent of this is to promote an awareness of such work to encourage thereby greater participation and also timely use of the results of this work.

48891 **Progress in the development of standard procedures for the global method of calibration of photovoltaic reference cells.** Whitaker, R.D.; Purnell, A.W.; Zerlaut, G.A. *Solar Cells;* 7: No. 1/2, 135-146(Nov 1982). (CONF-810748—).

From Commercial photovoltaics measurements workshop; Vail, CO, USA (27 Jul 1981).

Experiments are going on at DSET Laboratories to define an efficient and accurate procedure for the calibration of photovoltaic reference cells by the global method. A range of the pertinent atmospheric parameters is being sampled in experiments, which characterize reference cells by at least two different methods using hemispherical illumination. Initial investigations have utilized an altazimuth mount to maintain stable solar radiation on silicon reference cell test samples. Results are presented which confirm the reports of earlier investigations that the global calibration procedure is desirable. The limitations of the method are identified. The complete experimental plan is described with interim recommendations and a list of specific questions which the remainder of the program will address.

48892 **Spectral response measurements for solar cells.** Hartman, J.S.; Lind, M.A. *Solar Cells;* 7: No. 1/2, 147-157(Nov 1982). (CONF-810748—).

From Commercial photovoltaics measurements workshop; Vail, CO, USA (27 Jul 1981).

In this paper an overview of spectral response measurements, measurement systems and potential measurement problems is given relative to the characterization of solar cells. Measurement systems are outlined for determining the spectral response, the external quantum efficiency and the internal quantum efficiency of solar cells. Practical system components and measurement systems are presented together with their potential advantages and weaknesses. Finally, several solar cell properties (linearity, spatial uniformity etc.) are discussed which must be considered before a measurement system can be designed to evaluate a specific type of solar cell.

48893 **Use of measurements to detect electrical problems in operational photovoltaic arrays.** Forman, S.E. *Solar Cells;* 7: No. 1/2, 165-174(Nov 1982). (CONF-810748—).

From Commercial photovoltaics measurements workshop; Vail, CO, USA (27 Jul 1981).

The U.S. Department of Energy has set a 20 year lifetime goal for terrestrial photovoltaic modules. In its capacity as a photovoltaics field tests and applications center, the Lincoln Laboratory, Massachusetts Institute of Technology, has established various experimental test sites throughout the U.S.A., ranging in size from 1.5 to 100 kWsub(p). These sites contain modules from several manufacturers and serve as test beds for photovoltaic system components. Since May 1977, over 11000 modules have been placed in service at these sites, of which a total of 250 have suffered electrical failures. In previous reports, emphasis has been placed on failure modes and the types of physical and electrical degradation found in modules. In this paper the methods used to detect failures in operational photovoltaic power-generating systems are reported for several Lincoln Laboratory test sites.

48894 **High power current-voltage curve tracer employing a capacitive load.** Warner, T.H.; Cox, C.H. III. *Solar Cells;* 7: No. 1/2, 175-181(Nov 1982). (CONF-810748—).

From Commercial photovoltaics measurements workshop; Vail, CO, USA (27 Jul 1981).

A portable photovoltaic voltage versus current curve tracer is discussed. The curve tracer employs a capacitive load to provide automatic sweeping of the array voltage. The unit is capable of measuring arrays of up to 10 kW in power but is smaller and lighter than a conventional 2.5 kW dissipative load.

1406 Photovoltaic Power Systems

REFER ALSO TO CITATION(S) 48843

48895 (CONF-830222—, pp 183-198) **Residential photovoltaic systems: lessons learned 1980-1982.** Kern, E.C. Jr. (Massachusetts Inst. of Tech., Cambridge). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48896 (CONF-830222—, pp 199) **System applications experiments: a success story.** Risser, V.V. (New Mexico State Univ., Las Cruces). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48897 (CONF-830222—, pp 209-222) **Photovoltaic fact or fiction.** Jones, G.J. (Sandia National Labs., Albuquerque, NM). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48898 (CONF-830222—, pp 253-263) **Central Station photovoltaic power generation.** Leonard, S.L. (Aerospace Corp., El Segundo, CA). 1983. NTIS, PC A17/MF A01.

From DOE photovoltaics program annual review meeting; Arlington, VA, USA (15 Feb 1983).

48899 **(EPRI/AP/EM—3124) Interconnecting dc-energy systems: responses to technical issues.** Curtice, D.; Patton, J.B. (Systems Control, Inc., Palo Alto, CA (USA); Patton (James B.), Durango, CO (USA)). Jun 1983. 78p. NTIS, PC A05/MF A01. Order Number DE83902685.

Photovoltaic systems and other dc-power systems will play a role in the future by providing power in many utility systems. Realization of projected economic benefits, however, depends on resolution of technical interconnection issues such as protection, power quality, and personnel-safety requirements. To further the understanding of these technical issues, this report summarizes the perspectives of many people involved in the integration of dc-power systems into utility-distribution systems using solid-state power-conditioning equipment. It discusses functional utility intrface requirements for: isolation, grounding, and interconnection, as well as operational issues such as: start-up, loss of utility, harmonics, reactive power, feeder balancing, and safety. These discussions are based on a wide range of opinions that were collected as written responses to a request for comments on a draft document Interim Working Guidelines and Discussion Concerning the Interface of Small Dispersed Photovoltaic Power Producers and Electric Utility Systems. More than 300 persons were solicited, and over 80 responded to this document which was jointly distributed by the Department of Energy's (DOE's) National Photovoltaics Program and the Electric Power Research Institute. The respondents spanned the spectrum of organizations concerned with dc power system development: utilities, developers, standards makers, research organizations, and consultants. This report summarizes the opinions of these respondents on the major technical issues of interconnection.

48900 (SAND—83-0604, pp 31) **Initial results from the 1 MW Lugo project.** Lewis, J.H. (Arco Solar Industries, Woodland Hills, CA). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

1407 Solar Thermal Power Systems

REFER ALSO TO CITATION(S) 49320

1408 Ocean Thermal Gradient And Salinity Gradient Power Systems

48901 **(DOE/RA/50164—1) Assessment of seafloor burial of proposed OTEC power-transmission cables.** (Naval Civil Engineering Lab., Port Hueneme, CA (USA)). Jan 1982. Contract AI02-80RA50164. 438p. NTIS, PC A19/MF A01. Order Number DE83016401.

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This study assesses the need for protection of the seafloor OTEC power transmission cables, identifies the means, or development requirements, for accomplishing the required protection, and determines the costs and benefits associated with this protection. Protection of the bottom cable along the entire route from the shoreline to the riser cable were evaluated at four specific sites. Three of the four sites are "island sites"; they are immediately offshore of: (1) Kahe Point, Oahu, Hawaii; (2) Punta Yeguas, Puerto Rico; and (3) Cabras Island, Guam. The fourth site is in the Gulf of Mexico, due West of Tampa, Florida. All four sites are located in the tropical zones and are fully exposed to open ocean wind waves and currents. Cable routes from the shore to platform site are generally normal to the depth contours fronting the offshore slopes. All four sites are subject to severe hurricane winds and wave action. A total of 1061 sumarine communication cable faults were accumulated and analyzed during the initial portion of this study. These faults cover 101 years (1879 to 1980) of data collection and are reported in probabilistic terms keyed to water depth. Chafing and corrosion were found to be the most common hazard causing just over half of the reported incidents. Fishing activities, specifically trawlers and dredgers, wee the second most common hazard, accounting for approximately one-quarter of the reported incidents. The status of seafloor cable protection technology is also addressed

in this study. A comprehensive summary identifying the most suitable commercial systems has been conducted. Both cable and pipeline protection systems were included as well as previous relevant experience and operating conditions.

48902 **(ETEC—82-19) OTEC-1 test operations experience. Final report.** Hoshide, R.K.; Klein, A.; Polino, D.L.; Poucher, F.W. (Rockwell International Corp., Canoga Park, CA (USA). Energy Technology Engineering Center). 15 Jul 1983. Contract AC03-76SF00700. 433p. NTIS, PC A19/MF A01. Order Number DE83016337.

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During Phase III, the complete integrated system was operated, and information was obtained on the performance of the test article, the performance of the seawater and ammonia systems, the operation of the platform and moor systems, the effects of biofouling countermeasures, and the effects of the OTEC cycle on the environment. After several months spent in completing construction of the test system and checking out and repairing the various systems, 4 months of test operations were conducted before funding constraints caused the discontinuation of the test program. Plans were made for long-term storage and/or disposition of the test facility. The OEC test platform is currently located at Pearl Harbor, in the US Navy Inactive Reserve Fleet anchorage. The CWP was placed in underwater storage adjacent to the moor, awaiting a decision on final disposition. In October 1982, the CWP was recovered and custody given to the State of Hawaii. Although the test period lasted only about 4 months, deployment and at-sea operation of a large-scale OTEC plant was demonstrated, and information was obtained towards satisfying each of the objectives of the OTEC-1 project. This document summarizes the OTEC-1 test operations experience, discusses technical lessons learned, and makes recommendations for future OTEC plants.

1409 Solar Thermal Utilization

REFER ALSO TO CITATION(S) 48918, 48918, 49383, 49417, 49422, 49424

48903 **(AD-A—125682/5) Solfeas: an interactive program for estimating the economic feasibility of an active solar thermal energy system. Final report.** Joncich, D.M.; Sohn, C.W. (Army Construction Engineering Research Lab., Champaign, IL (USA)). Jan 1983. 72p. (CERL-TR-E—180). NTIS, PC A04/MF A01.

SOLFEAS is an interactive computer program developed to provide Corps of Engineers Field Operating Agencies (FOAs) with a simple, inexpensive means of estimating the economic feasibility of an active solar thermal energy system. SOLFEAS can project paybacks for each of four solar system types: (1) service water heating/preheating (domestic hot water and/or process hot water), (2) space heating only, (3) combined space - service water heating, and (4) combined space - service water heating/space cooling.

48904 **(CAPE—2834) Ingham County Medical Care Facility solar energy project (Engineering Materials).** (Manyam and Associates, Inc., Lansing, MI (USA)). 20 Jul 1983. USDOE-TIC, PO Bx 62, Oak Ridge, TN 37830.

8 35-mm aperture cards.

A complete set of as-built drawings for the Ingham County Geriatric Medical Care Facility's solar water heating system is included. These drawings accompany report No. DOE/CS/32382-T1 and DOE/CS/32382-T2. (LS)

48905 **(DOE/CH/10122—17) Comparison of the analytically developed and field-measured overall conductive heat-transfer coefficients in passive-solar residential construction.** Gustashaw, D.H. (ESG, Inc., Atlanta, GA (USA)). Jul 1983. Contract AC02-82CH10122. 87p. NTIS, PC A05/MF A01. Order Number DE83016551.

During the implementation of the Class B Passive Solar Performance Program, a task requirement made it necessary to develop theoretical and corresponding empirical conductive heat transfer coefficients for eight passive solar homes in the southeastern United States. It became apparent during this task that a variance existed between the widely accepted analytical value and the value obtained from on-site testing. In some cases, this variance was so large that a review of the calculation and testing procedure was necessary. It is the objective of this paper to present these values and explain the variances that exist and possibly what caused them.

48906 **(DOE/CS/32382—T1) Operational and maintenance instruction manual for the Ingham County Geriatric Medical Care Facility solar water-heating system.** (Manyam and Associates, Inc., Lansing, MI (USA)). 29 Jul 1983. Contract AC03-76CS32382. 262p. NTIS MF A01. Order Number DE83015628.

Microfiche only, copy does not permit paper copy reproduction; CAPE-2834, available from Technical Information Center, P.O. Box 62, Oak Ridge, TN 37830.

The Ingham County solar system consists of approximately 10,000 square feet of solar collectors connected in a closed configuration loop. The primary loop solution is a 1:12 mixture of water and propylene glycol which flows through the tube side of a heat exchanger connected to the primary storage tank. The heat energy which is supplied to the primary storage tank is subsequently used to preheat the temperature of the laundry water, kitchen water, and domestic potable water. Included in this report are: detailed drawings and flow chart; operational methodology; preventive maintenance instructions; general instructions and safety precautions; and a corrective maintenance and tabulation of failure modes. Appendices include: manufacturers technical manual and component specifications; IBM data sensors and responsibilities; digital county monitor operations manual; and on site monitor operations manual. Reference CAPE-2834. (LS)

48907 **(DOE/CS/32382—T2) Ingham County Geriatric Medical Care Facility solar water-heating system refurbishments. Final technical report.** (Manyam and Associates, Inc., Lansing, MI (USA)). Jul 1983. Contract AC03-76CS32382. 44p. NTIS, PC A03/MF A01. Order Number DE83015758.

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The tasks of the refurbishment of a damaged solar water heating system are outlined. The system is a closed loop, 50% glycol antifreeze system consisting of 14 rows of 6 series manifolds each containing 6 solar collectors connected in parallel for a total of 504 modules. The Wyle Laboratories' test report for the Revere Model 132 flat plate collector is appended. A collector test plan and photographs are also appended. Reference CAPE-2834. (LS)

48908 **(EUR—8165-DE) Development of self-supplying solar cooling systems with concentrating collectors.** Simon, H. (Commission of the European Communities, Luxembourg. Directorate-General for Science, Research and Development). 1982. 34p. (In German). Commission of the European Communities, Luxembourg.

The pilot prototype of the solar ammonia-water-absorption-type refrigerator has been investigated (with electrical collector simulation) with respect to its system behaviour. A system with power decoupling by thermo oil interim storage has been compared with the direct coupling between collector and absorption-type refrigerator. In the case of direct coupling, system control was entirely by self-stabilization effects. In both variants of the system with the still incompletely adjusted absorption-type refrigerating aggregate the refrigeration efficiency is about 20% below the data predicted for high-efficiency solar cooling systems. With a (technically uncritical) halved coefficient of the air source heat exchanger for the absorber cooling process the investigated cooling system with self-supplying cooling water is convenient for air-conditioning even at extreme air temperatures.

48909 **(NP—3770320) Some applications of solar energy for developing countries.** (Bundesverband Solarenergie, Essen (Germany, F.R.)). Apr 1981. 17p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83770320.

This informatory brochure published by BSE describes the fields of application for solar process heat and the delivery possi-

bilities of BSE member-companies. Detailed information is availabe from BSE or its member-companies.

48910 (NP—3770321) **Solar energy for process technology.** (Bundesverband Solarenergie, Essen (Germany, F.R.)). Apr 1981. 15p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83770321.

This informative brochure published by BSE describes the fields of application for solar process heat and the delivery possibilities of BSE member companies. Detailed information is available from BSE or its member-companies.

48911 (STF—62A82012) **IEA Task VIII: Passive and hybrid solar low energy buildings. National research workplan for Norway's participation.** Aschehoug, Oe. (SINTEF, Trondheim (Norway)). May 1982. 14p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83750969.

This research workplan describes Norwegian activities within the IEA Task VIII project:"Passive and hybrid solar low energy buildings". It is based on the operating agent's overall task workplan and adheres closely to this. Its main purpose is to identify relevant projects and responsible individuals.

48912 **Solar aircraft.** Weissert, H.; Kleinwaechter, J. German(FRG) Patent 3,002,828/A/. 30 Jul 1981. Filed date 26 Jan 1980. 12p. (In German).

This invention is concerned with a solar energy system for propelling aircraft. Obtained are forces for aerodynamic lift and impetus. The lifted body had a transparent upper surface for the sun light, but black or reflecting for IR-radiation and high thermal insulation properties. Inside of the lifted body, the air temperature increases and is lifted by convection influence. The air resistance of this body is low in horizontal direction and higher in vertical position. The payload could be shifted, so that the positive or negative angle of the whole body can be selected. By this principal it is possible to transform the static lifting force in a dynamic impetus.

1410 Solar Collectors And Concentrators

REFER ALSO TO CITATION(S) 48845, 48865, 48868, 48870, 48873, 48874, 48878, 48882, 48884, 49531

48913 (CONF-830229—, pp 337-342) **Energy entering large light transmitting areas.** Fischer, U. (Technical service/plastics, Darmstadt, Germany). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The total energy transmittance of a glazing material can be measured as a function of the angle of incidence. DIN 5034, part 2 describes the procedures of calculating irradiances on optionally oriented and inclined surfaces for different days, daytimes, sky conditions, and locations. Now it is possible to calculate the penetrating global radiation more precisely than before. Minimum surface area elements made of stretched acrylic are extremely stiff glazing elements. Completely light transmitting suspended lattice shell structures are a new type of zero energy skyscrapers.

48914 (SAND—83-0604, pp 193-200) **Concentrator optics research.** Stillwell, C.B. (Sandia National Labs., Albuquerque, NM). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48915 (SAND—83-0604, pp 206-214) **Design and development of laminated Fresnel lens parquets for point focus PV systems.** Baum, B.; Diehl, W.R. (Springborn Labs., Inc., Enfield, CT). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48916 (SAND—83-0604, pp 215-221) **TIR Fresnel lenses.** James, L.W. (L.W. James and Associates, Fort Collins, CO). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48917 (SAND—83-0604, pp 222-231) **Environmental degradation of solar optical materials.** Smith, C.A.; Kojima, C.J. (McDonnell-Douglas Corp., Huntington Beach, CA). Apr 1983. NTIS, PC A13/MF A01. (CONF-830477—).

From 10. photovoltaic cencentrator project integration meeting; Albuquerque, NM, USA (6 Apr 1983).

48918 **Roof absorber.** Bleickert, M. German(FRG) Patent 3,008,129/A/. 10 Sep 1981. Filed date 4 Mar 1980. 6p. (In German).

The invention deals with a new system for absorbing ambient heat. The absorber consists of plastic pipes connecting a plastic heat exchanger to a heat pump. The system is used for space and water heating. More solar collectors on the roof could be linked to the heating system. The invention is characterized by low costs of material and the installation. Features of the invention are explained in a drawing.

1420 Heat Storage

48919 (PB—83-175786) **Using solar heating with asphalt storage - Lubbock, Texas. Final report.** Hankins, K.D. (Texas Dept. of Highways and Public Transportation, Austin (USA)). Oct 1981. 42p. NTIS, PC A03/MF A01.

This is the final report of a project which used solar energy to heat a 12,000-gallon asphalt storage tank. A water heater was used as an auxiliary system. The report contains a history of the maintenance, performance, and costs. The asphalt heated was a rapid-cure cutback.

15 GEOTHERMAL ENERGY

1502 Geology And Hydrology Of Geothermal Systems

REFER ALSO TO CITATION(S) 48924

48920 (DOE/ID/12145—T1) **Model for the heat source of the Cerro Prieto magma-hydrothermal system, Baja California, Mexico.** Elders, W.A.; Bird, D.K.; Williams, A.E.; Schiffman, P.; Cox, B. (California Univ., Riverside (USA). Inst. of Geophysics and Planetary Physics; Arizona Univ., Tucson (USA). Dept. of Geosciences). 1981. Contract FC07-80ID12145. 20p. NTIS, PC A02/MF A01. Order Number DE83016670.

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Earlier studies at Cerro Prieto led to the development of a qualitative model for fluid flow in the geothermal system before it was drilled and perturbed by production. Current efforts are directed towards numerical modeling of heat and mass transfer in the system in this undisturbed state. This one-dimensional model assumes that the heat source was a single basalt/gabbro intrusion which provided heat to the system as it cooled. After compilation of various information of the physical properties of the reservoir, the enthalpy contained in two 1 cm thick sections across the reservoir orthogonal to each other was calculated. Various shapes, sizes and depths for the intrusion were considered as initial conditions and boundary conditions for the calculations of heat transfer. A family of numerical models which so far gives the best matches to the conditions observed in the field today have in common a funnel-shaped intrusion with a top 4 km wide emplaced at a depth of 5 km some 30,000 to 50,000 years ago, providing heat to the geothermal system.

48921 (UCR/IGPP—83/4) Hydrothermal-flow regime and magmatic heat source of the Cerro Prieto geothermal system, Baja California, Mexico. Elders, W.A.; Bird, D.K.; Williams, A.E.; Schiffman, P. (California Univ., Riverside (USA). Inst. of Geophysics and Planetary Physics; Stanford Univ., CA (USA). Dept. of Geology). 1982. Contract FC07-80ID12145. 47p. NTIS, PC A03/MF A01. Order Number DE83016726.

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This detailed three-dimensional model of the natural flow regime of the Cerro Prieto geothermal field, before steam production began, is based on patterns of hydrothermal mineral zones and light stable isotopic ratios observed in rock samples from more than fifty deep wells, together with temperature gradients, wireline logs and other data. At the level so far penetrated by drilling, this hydrothermal system was heated by a thermal plume of water close to boiling, inclined at 45°, rising from the northeast and discharging to the west. To the east a zone of cold water recharge overlies the inclined thermal plume. Fission track annealing studies shows that the reservoir reached 170°C only 10^4 years ago. Oxygen isotope exchange data indicate that a 12 km^3 volume of rock subsequently reacted with three times its volume of water hotter than 200°C. Averaged over the duration of the heating event this would require a flow velocity of about 6 m/year through the pores of a typical cross section of the reservoir having an average porosity of 10%. Although this is an extensional tectonic environment of leaky transform faulting in which repeated intrusions of basalt magma are likely, for simplicity of computation possible heat sources were modelled as simple two dimensional basalt intrusions of various sizes, shapes and locations. We have calculated a series of two-dimensional convective heat transfer models, with different heat sources and permeability distributions. The models which produce the best fit for the temperature distributions observed in the field today have in common a heat source which is a funnel-shaped basalt intrusion, 4 km wide at the top, emplaced at a depth of 5 km to 6 km about 40,000 to 50,000 years ago.

48922 (UCR/IGPP—83/6) Active metasomatism in the Cerro Prieto geothermal system, Baja California, Mexico: a telescoped low pressure/temperature metamorphic facies series. Schiffman, P.; Elders, W.A.; Williams, A.E.; McDowell, S.D.; Bird, D.K. (California Univ., Riverside (USA). Inst. of Geophysics and Planetary Physics; Michigan Technological Univ., Houghton (USA). Dept. of Geology and Geological Engineering; Stanford Univ., CA (USA). Dept. of Geology). 1983. Contract FC07-80ID12145. 21p. NTIS, PC A02/MF A01. Order Number DE83016725.

In the Cerro Prieto geothermal field, carbonate-cemented, quartzofeldspathic sediments of the Colorado River delta are being actively metasomatized into calc-silicate metamorphic rocks by reaction with alkali chloride brines between 200° and 370°C, low fluid and lithostatic pressures, and low oxygen fugacities. Petrologic investigations of drill cores and cutting from over 50 wells in this field identified a prograde series of calc-silicate mineral zones which include as index minerals: wairakite, epidote, prehnite, and clinopyroxene. Associated divariant mineral assemblages are indicative of a very low pressure/temperature metamorphic facies series which encompasses the clay-carbonate, zeolite, greenschist, and amphibolite facies. This hydrothermal metamorphic facies series, which is becoming increasingly recognized in other active geothermal systems, is characterized by temperature-telescoped dehydration and decarbonation mineral equilibria. Its equivalent should now be sought in fossil hydrothermal systems.

48923 (UCR/IGPP—83/7) Calc-silicate mineralization in active geothermal systems. Bird, D.K.; Schiffman, P.; Elders, W.A.; Williams, A.E.; McDowell, S.D. (Stanford Univ., CA (USA). Dept. of Geology; California Univ., Riverside (USA). Inst. of Geophysics and Planetary Physics; Michigan Technological Univ., Houghton (USA). Dept. of Geology and Geological Engineering). 1983. Contract FC07-80ID12145. 79p. NTIS, PC A05/MF A01. Order Number DE83016724.

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The detailed study of calc-silicate mineral zones and coexisting phase relations in the Cerro Prieto geothermal system were used as examples for thermodynamic evaluation of phase relations among minerals of variable composition and to calculate the chemical characteristics of hydrothermal solutions compatible with the observed calc-silicate assemblages. In general there is a close correlation between calculated and observed fluid compositions. Calculated fugacities of O_2 at about 320°C in the Cerro Prieto geothermal system are about five orders of magnitude less than that at the nearby Salton Sea geothermal system. This observation is consistent with the occurrence of Fe^{3+} rich epidotes in the latter system and the presence of prehnite at Cerro Prieto.

1503 Geothermal Exploration And Exploration Technology

48924 (NMERDI—2-67-2135) Evaluation of the geothermal resource in the area of Albuquerque, New Mexico. Jiracek, G.R.; Swanberg, C.A.; Morgan, P.; Parker, M.D. (New Mexico Univ., Albuquerque (USA). Dept. of Geology). Jul 1983. 179p. NTIS, PC A09/MF A01. Order Number DE83016066.

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Factors indicating a potential geothermal resource near Albuquerque are: (1) nearby volcanoes active as recently as 120,000 years ago, (2) gravity interpretation indicating a potential reservoir averaging 1.5 km thickness, (3) high heat flow near the city, (4) warm waters (>30°C) in municipal wells, (5) recent seismicity indicating active faulting, thereby, allowing the possibility of deep hydrothermal circulation, (6) high shallow (<30 m) temperature gradients (>100°C/km) discovered in our drillholes, (7) deeper (<500 m) gradients from water wells exceeding 80°C/km, and (8) chemical analyses of 88 groundwater samples yielding estimated base reservoir temperatures as high as 190°C. An area of elevated shallow temperature gradients (≦ 140°C/km) was discovered a few kilometers west of Albuquerque by our 69 hole drilling program. Resistivity, magnetic, and gravity measurements combined with computer modeling suggests that heated ground water is forced closer to the surface here by flow over a buried ridge. A well drilled nearby yielded the highest recorded temperature in the Albuquerque area at its maximum depth (32.8°C at 364 m). The deep gradient is 35°C/km. An oil test well close by reported large volumes of water at 1 km; therefore, the possibility of a low temperature (>50°C) geothermal resource exists west of Albuquerque at less than 1 km depth.

48925 (NYSERDA—83-6) Microseismic monitoring for evidence of geothermal heat in the capital district of New York. Final report, Phases I-III. (New York State Geological Survey, Albany (USA)). Jun 1983. 58p. NTIS, PC A04/MF A01. Order Number DE83015504.

The seismic monitoring work of the geothermal project was initiated for the purpose of determining more exactly the relationship between seismicity and the postulated geothermal and related activity in the Albany-Saratoga Springs area in upstate New York. The seismic monitoring aspect of this work consisted of setting up and operating a network of seven seismograph stations within and around the study area capable of detecting and locating small earthquakes. To supplement the evidence from present day seismic activity, a list of all known historical and early instrumental earthquakes was compiled and improved from original sources for a larger region centered on the study area. Additional field work was done to determine seismic velocities of P and S phases by special recording of quarry blasts. The velocity results were used both as an aid to improve earthquake locations based on computer programs and to make inferences about the existence of temperature anomalies, and hence geothermal potential, at depths beneath the study area. Finally, the level in the continuous background earth vibration, microseisms, was measured throughout the study area to test a possibility that a relationship may exist at the surface between the level in microseisms and the geothermal or related activity. The observed seismic activity within the study area, although considerably higher (two to three times) than inferred from the historical and early instrumental data, is still not only low for a potential geothermal area but appears to be related to coherent regional tectonic stresses and not to the proposed more localized geothermal activity reflected in the mineralized, CO_2 rich spring discharge.

48926 **(PB—83-197632) Electrical resistivity survey in the northeastern Golan Heights (geothermal project).** Rotstein, Y.; Goldberg, S.; Klang, A. (Institute for Petroleum Research and Geophysics, Holon (Israel)). Jul 1978. 34p. (GE—380/77). NTIS, PC E04/MF E01.

A series of deep electrical resistivity soundings have been conducted in the northeastern Golan Heights as part of the geothermal project in Israel. This area which includes a large number of Tertiary volcanic cones is considered to be one of the most promising in Israel for geothermal development. The results of the survey show, however, that the area is cold and there is no apparent residual heat which may encourage additional exploration. A few of the soundings show the thickness of the volcanic sequence away from the cones to be about 350-500m.

48927 **(PB—83-197657) Magnetotelluric survey in the Tamar area.** Klang, A.; Rotstein, Y.; Goldberg, S. (Institute for Petroleum Research and Geophysics, Holon (Israel)). Mar 1979. 18p. (MT—260/75). NTIS, PC E03/MF E01.

In an attempt to discover the significance of a low apparent resistivity anomaly detected in roving dipole measurements, four magnetotelluric soundings were measured in the Tamar area. The results of this survey indicate anisotropic apparent resistivities in all the measured soundings. The survey was performed as part of the geothermal program in Israel. Only a qualitative interpretation could be carried out. The possibility of a low resistivity anomaly in the area of site TR-4, added to the effect of a two dimensional structure, is considered. It is recommended that one or two wells be drilled at 1.5 Km west of Tamar 9 well to a depth of 150-200 m and the temperature gradient be measured in them.

48928 **(PB—83-211870) Geopressured well project Sweet Lake, Cameron Parish, Louisiana. Final report Feb 80-Sep 82.** Hoffman, K.S. (Magma Gulf/Technadril, Houston, TX (USA)). Jan 1983. 228p. NTIS, PC A11/MF A01.

The Sweet Lake geopressured-geothermal test well(Magma Gulf-Technadril/DOE Amoco Fee 1) was drilled in Cameron Parish, Louisiana under a Department of Energy contract. The primary purpose was to demonstrate technological and economic recovery of the geopressured-geothermal resource. The Gas Research Institute funded ancillary work in mud logging, micropaleontology, organic geochemistry, rock mechanics, and core analysis. The well was perforated in the upper Frio Miogypsinoides sand, at a depth of 15,387-15,414 feet. Mud logging and micropaleontology were used to monitor stratigraphic position during the drilling of the well and were particularly important in picking the casing point at the top of the Miogypsinoides sand. Several phases of testing have been carried out, including an initial flow test, a reservoir limit test, and long-term (6+ month) testing.

48929 **Acoustic emissions as a tool for hydraulic fracture location: experience at the Fenton Hill Hot Dry Rock site.** Albright, J.N.; Pearson, C.F. (Los Alamos Natl. Laboratory). *Society of Petroleum Engineers of A.I.M.E. (American Institute of Mining, Metallurgical and Petroleum Engineers), Paper;* **22**: No. 4, 523-530(Aug 1982).

Microearthquakes with magnitudes between -6 and -2 have been observed in three successive massive injections of water at the hot dry rock geothermal energy development project's demonstration site at Fenton Hill, NM. The injections were part of a program to increase the heat transfer area of hydraulic fractures and to decrease the flow-through impedance between wells in the energy extraction system under construction. The microearthquakes were used in mapping the location of the extended hydraulic fractures. The large shear- to compressional-wave-amplitude ratio observed in the signals suggests that the microearthquakes result from shear failure, probably on preexisting planes of weakness that intersect or make up the main hydraulic system. Failure resulting from increased pore pressure is a likely cause for the microearthquakes. Knowledge of the failure criterion for the reservoir rocks permits calculation of the pore pressure increases necessary for failure. At Fenton Hill, it appears that pressures 2 Pa (0.00029 psi) above hydrostatic are necessary. For this hypothesis of microearthquake occurrence to hold, the effective reservoir permeability must be four orders of magnitude above that for the bulk rock, as would be the case if there were permeable joints or fractures in the reservoir before hydraulic stimulation.

1505 Economic And Financial Aspects

REFER ALSO TO CITATION(S) 48936

1506 Environmental Aspects And Waste Disposal

REFER ALSO TO CITATION(S) 49840

48930 **(PB—83-191908) Separation of thermal and chemical effects in evaluating geothermal influences on aquatic biota. Completion report.** Resh, V.H.; McElravy, E.P.; Wood, J.R.; Lambperti, G.A. (California Univ., Davis (USA). Water Resources Center; Office of Water Research and Technology, Washington, DC (USA)). Mar 1983. 59p. NTIS, PC A04/MF A01.

In this study a field based, stream microcosm system to experimentally separate the effects of the thermal and chemical components of geothermal fluids on the benthic community was developed. Using this system the separate and combined influences of these components on the numerical abundance of bacteria, the standing crop and productivity of algae, and the density, standing stock, and community structure of macroinvertebrates were evaluated. This heat shock experiment simulated acute thermal effects on organisms that drift into the lethal temperature zones that seasonally occur in geothermal streams. It also mimicked the effects of heated effluents on aquatic organisms that are drawn into the cooling water intake of a power plant, or entrained in the discharge plume.

1508 Geothermal Power Plants

48931 **(EGG—2253) Thermal and hydraulic performance tests of a sieve-tray direct-contact heat exchanger vaporizing pure and mixed-hydrocarbon Rankine-cycle working fluids.** Mines, G.L.; Demuth, O.J.; Wiggins, D.J. (EG and G Idaho, Inc., Idaho Falls (USA)). Aug 1983. Contract AC07-76ID01570. 63p. NTIS, PC A04/MF A01. Order Number DE83016428.

Experiments investigating a sieve-tray direct-contact heat exchanger were conducted at the Raft River Geothermal Test Site in southeastern Idaho using the 60-kW Mobile Heat Cycle Research Facility operating in the thermal loop mode (without a turbine). Isobutane, propane, and several hydrocarbon mixtures were heated and boiled in the direct-contact column, which is ~ 12 in. in diameter and 19-1/2 ft. high, using the energy from a 280°F geothermal resource. Using pure fluids, isobutane or propane, the column operated much as intended, with 17 trays used for preheating and one or two accomplishing the boiling. For the pure fluids, individual tray efficiencies were found to be 70% or higher for preheating, and close to 100% for boiling; column pinch points were projected to be well under 1°F with some runs reaching values as low as ~ 0.02°F. Maximum geofluid throughputs for the isobutane tests corresponded roughly to the terminal rise velocity of a 1/32 in. working fluid droplet in geofluid. Boiling was found to occur in as many as 12 trays for the mixtures having the highest concentrations of the minor component, with overall efficiencies in the boiling section estimated on the order of 25 or 30%. Preheating tray efficiencies appeared to be fairly independent of working fluid, with pinch points ranging from as low as ~ 0.03°F for a 0.95 isobutane/0.05 hexane mixture to ~ 2.3°F for a 0.85 isobutane/0.05 hexane mixture. Column operation was noticeably less stable for the mixtures than for the pure fluids, with maximum throughputs dropping to as low as 40 to 50% of those for the pure fluids.

1509 Geothermal Engineering

REFER ALSO TO CITATION(S) 48928

48932 (BNL—33132) Shape memory alloy seals for geothermal applications. Final report. Report ESG-82-14. (Rockwell International Corp., Canoga Park, CA (USA). Energy Systems Group). 30 Jul 1982. Contract AC02-76CH00016. 65p. NTIS, PC A04/MF A01. Order Number DE83016727.

A novel temperature-actuated seal for geothermal applications is under development. This program uses the shape memory property of nickel-titanium (Nitinol) alloys to achieve an improved seal in geothermal downhole pumps. Nitinol flange face seals and pump shaft seals have been designed, fabricated, and tested. It has been demonstrated that the shape memory effect of Nitinol alloys can be utilized to activate and maintain a leaktight seal in geothermal environments.

48933 (SAND—83-0584) Evaluation of aqueous-foam surfactants for geothermal drilling fluids. Rand, P.B.; Montoya, O.J. (Sandia National Labs., Albuquerque, NM (USA)). Jul 1983. Contract AC04-76DP00789. 32p. NTIS, PC A03/MF A01. Order Number DE83016446.

Aqueous foams are potentially useful drilling and cleanout fluids for geothermal applications. Successful use of foams requires surfactants (foaming agents) that can survive in the high-temperature geothermal environment. In this study, solutions of aqueous-foam-forming surfactants have been exposed to 260°C (500°F) and 310°C (590°F) in various chemical environments to determine if they can survive and make foams after exposure. Comparison of foams before and after exposure and the change in solution pH were used to evaluate their performance. Controlled liquid-volume-fraction foams, made in a packed-bed foam generator, were used for all tests. These tests have shown that many commercially available surfactants can survive short high-temperature cycles in mild acids, mild bases, and salt solutions as evidenced by their ability to make foams after exposure to high temperatures.

48934 (SGP-TR—61) Geothermal-reservoir engineering research at Stanford University. Second annual report, October 1, 1981-September 30, 1982. Ramey, H.J. Jr.; Kruger, P.; Horne, R.N.; Brigham, W.E.; Miller, F.G. (Stanford Univ., CA (USA). Stanford Geothermal Program). Sep 1982. Contract AT03-80SF11459. 71p. NTIS, PC A04/MF A01. Order Number DE83015866.

Progress in the following tasks is discussed: heat extraction from hydrothermal reservoirs, noncondensable gas reservoir engineering, well test analysis and bench-scale experiments, DOE-ENEL Cooperative Research, Stanford-IIE Cooperative Research, and workshop and seminars. (MHR)

1510 Direct Energy Utilization

48935 (DOE/ET/27196—T12) Geothermal direct-heat study: Imperial County, California. (VTN Consolidated, Inc., Irvine, CA (USA)). May 1983. Contract FC03-79ET27196. 95p. NTIS, PC A05/MF A01. Order Number DE83016236.

Potential applications of geothermal energy which would be compatible with the agricultural activities in the county were identified and a plan to attract potential users to the area was developed. The intent of the first effort was to identify general classifications of industries which could utilize geothermal heat in production processes. Two levels of analyses were utilized for this effort. Initially, activities relying on previously developed engineering and industrial concepts were investigated to determine capital costs, employment, and potential energy savings. Second, innovative concepts not yet fully developed were investigated to determine their potential applicability to the agricultural base of the county. These investigations indicated that the major potential applications of geothermal heat would involve industries related to food processing or other direct agriculture-related uses of raw materials produced or imported to the county. An implementation plan which can be utilized by the county to market direct heat applications was developed. A socioeconomics analysis examined the potential effects on the county from development of direct heat projects. The county's planning and permitting requirements for dirct heat projects were also examined.

48936 (PNL-SA—9602) GEOCITY: a computer model for systems analysis of geothermal district heating and cooling costs. Fassbender, L.L.; Bloomster, C.H. (Pacific Northwest Lab., Richland, WA (USA)). Jun 1981. Contract AC06-76RL01830. 30p. (CONF-820112—12). NTIS, PC A03/MF A01. Order Number DE83015430.

From Semi-annual meeting of the American Society of Heating, Refrigerating, and Air Conditioning Engineers; Houston, TX, USA (24 Jan 1982).

GEOCITY is a computer-simulation model developed to study the economics of district heating/cooling using geothermal energy. GEOCITY calculates the cost of district heating/cooling based on climate, population, resource characteristics, and financing conditions. The basis for our geothermal-energy cost analysis is the unit cost of energy which will recover all the costs of production. The calculation of the unit cost of energy is based on life-cycle costing and discounted-cash-flow analysis. A wide variation can be expected in the range of potential geothermal district heating and cooling costs. The range of costs is determined by the characteristics of the resource, the characteristics of the demand, and the distance separating the resource and the demand. GEOCITY is a useful tool for estimating costs for each of the main parts of the production process and for determining the sensitivity of these costs to several significant parameters under a consistent set of assumptions.

1520 Geothermal Data And Theory

48937 (DOE/ER/10361—T2) Effects of water-saturation on strength and ductility of three igneous rocks at effective pressures to 50 MPa and temperatures to partial melting. Bauer, S.J.; Friedman, M.; Handin, J. (Texas A and M Univ., College Station (USA). Center for Tectonophysics). 1981. Contract AS05-79ER10361. 6p. NTIS, PC A02/MF A01. Order Number DE83015143.

Instantaneous-failure strengths and ductilities of water-saturated cylindrical specimens of Charcoal Granodiorite, Mount Hood Andesite, and Cuerbio Basalt are determined at a strain rate of $10^{-4}s^{-1}$ and at effective confining pressures (Pe) of 0 and 50 MPa and at temperatures to partial melting. The data indicate: (1) at Pe = 0 and 50 MPa [Pc and Pp of 50 MPa and of 100 and 50 MPa, respectively] the granodiorite does not water-weaken; (2) at these same Pe the more porous and finer-grained andesite begins to exhibit water-weakening at about 600°C; (3) at Pe = 0 and 870-900°C the andesite's wet strength averages 20 MPa compared to 100 MPa, dry; (4) at Pe = 50 MPa and 920°C its wet strength is 45 MPa compared to 160 MPa dry; (5) at Pe = 0, the basalt appears to be water-weakened above 800°C; (6) water-saturated specimens deformed at temperatures less than T/sub m/ exhibit ultimate strengths at less than 2 percent shortening and then work-soften along faults; and (7) both dry and wet specimens deform primarily by brittle fracture. Extrapolations indicate: (1) crystalline rocks should be drillable because they remain brittle until partial melting occurs, and penetration rates should increase with temperature because there is a corresponding decrease in brittle fracture strength; (2) boreholes in "water-filled" holes will be stable to >10 km at temperatures <T/sub m/; (3) if temperatures are kept to ≦ 700°C, even open boreholes in granodiorite are apt to be stable to >10 km; and (4) open boreholes in the andesite are apt to be much less stable, and at similar temperatures would fail at 2 to 5-km depth.

48938 (PB—83-203257) Gas saturation in formation waters. volume i. Final report mar 79-aug 82. Schreiber, J.D.; Osif, T.L. (Gas Research Inst., Chicago, IL (USA)). Mar 1983. 285p. NTIS, PC A13/MF A01.

The objective of this program was to provide understanding of the chemistry of brines from geopressured formations by obtaining and analyzing down-hole and surface samples from geopressured wells and by the development of numerical thermodynamic reconstruction code to model chemistry. There were two major areas of work performed in this program. First, sampling and analysis techniques were examined and tested in the field. Second, a

computer code was developed that allows simulation of the behavior of produced fluids by means of thermodynamic reconstruction.

40939 (PB—83-203265) Gas saturation in formation waters. Final report Mar 79-Aug 82. Schreiber, J.D.; Osif, T.L. (Institute of Gas Technology, Chicago, IL (USA)). Mar 1983. 331p. NTIS, PC A15/MF A01.

The objective of this program was to provide understanding of the chemistry of brines from geopressured formations by obtaining and analyzing down-hole and surface samples from geopressured wells and by the development of numerical thermodynamic reconstruction code to model chemistry.

16 TIDAL POWER

1608 Wave Energy Converters

40940 (SI-R—780409-8) Numerical model for the frictional absorption of water waves. Hutton, G. (Sentralinstitutt for Industriell Forskning, Oslo (Norway)). Oct 1981. 35p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83750964.

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The method used here is based upon linear wave theory and certain equations for the frictional absorption of power from water waves. The frictional absorption one is concerned with here is that due to walls and bottom. Internal friction is neglected and no attempt is made to calculate the power absorbed during breaking. One assumes that the propagating wave behaves approximately as a plane wave front even in the presence of converging or diverging walls and also during a changing depth. The assumption of stationarity is therefore questionable. The method is written especially for the analyses of waves propagating through a channel of arbitrary shape. The case of a nonplane waves propagating over a bottom can also be handled by using the propagation orthogonals (rays) as defining walls of channels which have zero friction. An example of a power conversion channel is given and the model is compared to some experimental results. 8 drawings, 3 tables.

40941 (SI-R—780409-9) Flexible cylinder in ocean waves. Brodersen, H. (Sentralinstitutt for Industriell Forskning, Oslo (Norway)). Mar 1982. 55p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83750962.

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The propagation of a linear wave normally incident upon an infinitely long, horizontal cylinder submerged in water has previously been investigated as part of a project on water wave focusing by means of submerged bodius. A simple harmonic wave travelling across the cylinder which is at rest was assumed. An expression for the velocity potential in terms of a rapidly converging series was then formed. In the present report it is assumed that the cylinder is flexible, and is allowed to suffer a small deformation as the waves pass. An explicitt expression for the velocity potential is obtained in terms of a rapid converging series. The forces on the cylinder is discussed, and the equation of motion is solved under the assumption that the cylinder is not far from being completely rigid.

40942 (SI-R—780409-10) Near field diffraction of two dimensional waves. Hutton, G. (Sentralinstitutt for Industriell Forskning, Oslo (Norway)). Aug 1982. 50p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83750963.

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The actual method presented in the report are more general than suggested in the title, and apply to the solution of two dimensional fields given certain boundary values. Only fields which satisfy the two dimensional wave equation or, in the stationary case, the Helmholtz equation are dealt with. The theoretical starting point will be two dimensional diffraction integrals over the boundary and, these require certain boundary values as input. The numerical methods, which are developed, are applicable to the solution of field values near the boundary. By "near" one means the distances which are much less than the wave length associated with the Helmholtz equation. This "near field" capability is important in many physical problems. One such case is water waves where typical dimensions of enclosures, structures, etc. are smaller than, or of the order of, the wavelength. The standard approximations made in optics are not valid in the near field. One is forced to solve mathematically exact formulations of wave fields. The formulations obtained from Green's theorem and the Helmholtz equation are exact within the restrictions imposed by the particular choice of the Green's function. The numerical solutions given are thus applicable for any two dimensional wave field calculation where the boundary conditions are satisfied, and the boundary values are known. 13 drawings, 1 table.

17 WIND ENERGY

1704 Economics

40943 Technical and economic progress in the development of wind power. Divone, L.V. (U.S. Department of Energy, Washington, D.C. (USA). Office of Solar Electric TechnologiesG Luther, E. (Planning Research Corporation, washington, D.C. (USA)). pp 119-130 of Fourth international symposium on wind energy systems. Wind energy systems, V.1. Bedford, England; BHRA Fluid Engineering (1982). (CONF-820922—Vol.1).

From 4. international symposium on wind energy systems; Stockholm, Sweden (21 Sep 1982).

1705 Environmental Aspects

40944 (SERI/TP—215-1954) Acoustic ranging technique with application to assessment of low-frequency acoustic noise of wind turbines. Hemphill, R. (Solar Energy Research Inst., Golden, CO (USA)). May 1983. Contract AC02-77CH00178. 12p. (CONF-830432—3). NTIS, PC A02/MF A01. Order Number DE83009406.

From Wind/solar energy conference; Kansas City, MO, USA (25 Apr 1983).

Impulsive low-frequency noise from wind turbines can cause annoyance particularly when a residential structure is involved. Such noise is typically generated in some spatially restricted region of a turbine rotor swept area. Low-frequency impulsive noise of the MOD-1 turbine was generated when the rotor blades passed downwind of the tower legs encountering the complex unsteady flows there. An acoustic ranging technique that aids assessment of the degree of concentration of acoustic generation within the turbine swept area and which determines the time-average spatial source region of such concentration is described. Practical applications and limitations of the process are discussed.

1706 Wind Energy Engineering

REFER ALSO TO CITATION(S) 40836

40945 (DOE/NASA/20320—47) DOE large horizontal-axis wind-turbine development at NASA Lewis Research Center. Linscott, B.S. (National Aeronautics and Space Administration, Cleveland, OH (USA). Lewis Research Center). 1983. Contract AI01-76ET20320. 15p. (NASA-TM—83444; CONF-830432—5). NTIS, PC A02/MF A01. Order Number DE83016423.

From Wind/solar energy conference; Kansas City, MO, USA (25 Apr 1983).

The large wind-turbine program is a major segment of the Federal Wind Energy Program sponsored by the Department of Energy (DOE). The NASA Lewis Research Center manages the large horizontal axis wind turbine program for DOE. The large wind turbine program is directed toward development of the technology for safe, reliable, environmentally acceptable large wind turbines that have the potential to generate a significant amount of electricity at costs competitive with conventional electric generation systems. In addition, these large wind turbines must be fully compatible with electric utility operations and interface requirements. There are several ongoing large wind system development projects directed toward meeting the technology requirements for utility applications. The first generation technology machines

(Mod-0A and Mod-1) successfully completed their planned periods of experimental operation in June 1982. The second generation machines (Mod-2) are in operation at selected utility sites. Third generation technology machines (Mod-5) are in the design phase and are planned for initial operation in late 1984 or early 1985. Each successive generation of technology has shown potential to increase reliability and energy capture, while reducing the cost of electricity. These advances are being made by gaining a better understanding of the system-design drivers, improvements in the analytical design tools, verification of design methods with operating field data, and the incorporation of new technology and innovative designs. This paper provides an overview of the large wind turbine activities managed by NASA Lewis. These activities include results from the first and second generation field machines (Mod-0A, -1, and -2), the status of the Department of Interior WTS-4 machine for which NASA is responsible for technical management, and the design phase of the third generation wind turbines (Mod-5).

48946 **(PB—83-220558) Wind energy for low head irrigation. Report for Oct 79-Sep 82.** Wiersma, J.L.; Bender, A.R. (South Dakota State Univ., Brookings (USA). Water Resources Inst.; Office of Water Research and Technology, Washington, DC (USA)). Apr 1983. 41p. NTIS, PC A03/MF A01.

An air compressor driven by a wind turbine can be used to operate an air lift water pump. In locations where a shallow aquifer yields a limited quantity of water per unit of time, it is a successful economical method of pumping water for the irrigation of a crop that does not have a critical period of water demand. The amount of submergence of the pumping unit is critical. The efficiency of the system increases as the submergence increases. The efficiency is also dependent upon the proper sizing of the eductor tube. The factors determining the size include submergence, pressure of compressed air, quantity of compressed air available, amount of water lift, and quantity of water required. The rate of air introduced to the eductor tube must be controlled for efficient operation.

48947 **(PNL—4403) Test application of a semi-objective approach to wind forecasting for wind-energy applications.** Wegley, H.L.; Formica, W.J. (Pacific Northwest Lab., Richland, WA (USA)). Jul 1983. Contract AC06-76RL01830. 99p. NTIS, PC A05/MF A01. Order Number DE83016641.

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The test application of the semi-objective (S-O) wind forecasting technique at three locations is described. The forecasting sites are described as well as site-specific forecasting procedures. Verification of the S-O wind forecasts is presented, and the observed verification results are interpreted. Comparisons are made between S-O wind forecasting accuracy and that of two previous forecasting efforts that used subjective wind forecasts and model output statistics. (LEW)

48948 **Department of energy (DOE) research program in structural analysis of vertical axis wind turbines.** Sullivan, W.N. (Scandia National Laboratories (USA)). pp 75-92 of Fourth international symposium on wind energy systems. Wind energy systems, V.1. Bedford, England; BHRA Fluid Engineering (1982). (CONF-820922—Vol.1).

From 4. international symposium on wind energy systems; Stockholm, Sweden (21 Sep 1982).

48949 **Meteorological field measurements at potential and actual wind turbine sites.** Renne, D.S.; Sandusky, W.F.; Hadley, D.L. (Pacific Northwest Laboratory (USA)); Berwager, S.D. (U.S. Department of Energy, Washington, D.C. (USA)). pp 141-154 of Fourth international symposium on wind energy systems. Wind energy systems, V.1. Bedford, England; BHRA Fluid Engineering (1982). (CONF-820922—Vol.1).

From 4. international symposium on wind energy systems; Stockholm, Sweden (21 Sep 1982).

48950 **Hawaiis wind data bank.** Neill, D.R. (University of Hawaii, Manoa (USA). Hawaii Natural Energy Institute). pp 175-194 of Fourth international symposium on wind energy systems. Wind energy systems, V.1. Bedford, England; BHRA Fluid Engineering (1982). (CONF-820922—Vol.1).

From 4. international symposium on wind energy systems; Stockholm, Sweden (21 Sep 1982).

48951 **Design lessons from the U.S. DOE small wind systems development projects.** Healy, T.J.; Dodge, D.M. (Rockwell International Corporation (USA). Rocky Flats Wind Systems Program). pp 351-364 of Fourth international symposium on wind energy systems. Wind energy systems. V.1. Bedford, England; BHRA Fluid Engineering (1982). (CONF-820922—Vol.1).

From 4. international symposium on wind energy systems; Stockholm, Sweden (21 Sep 1982).

20 ELECTRIC POWER ENGINEERING

48952 **(CONF-8104213—1) Microcomputer use for studying interconnected electric-system frequency.** Adams, R.K.; McIntyre, J.M.; Rochelle, R.W. (Oak Ridge National Lab., TN (USA)). 1981. Contract W-7405-ENG-26. 3p. NTIS, PC A02/MF A01. Order Number DE83015515.

From Computer fair conference and exposition; San Francisco, CA, USA (3 Apr 1981).

Interconnected electric-system frequency continually varies about the value of 60Hz in response to electric-load changes and as generation is adjusted to match load. The need for power-system load management due to generation constraints has promoted us to make a detailed study of this system frequency. We have used microcomputers both to record the output of frequency measuring instruments and to directly measure system frequency.

2001 Power Plants And Power Generation

REFER ALSO TO CITATION(S) 48772, 48791, 49013, 49073, 49270, 49271, 49282, 49283, 49291, 49292, 49322, 49640

48953 **(BMFT-FB-T—83-033) Increasing the efficiency of coal-fired power plants by means of a transition to maximum steam conditions.** Aurin, G.; Stadie, L. (Bundesministerium fuer Forschung und Technologie, Bonn (Germany, F.R.)). Apr 1983. 208p. (In German). NTIS (US Sales Only), PC A10/MF A01. Order Number DE83751091.

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It was the objective of the study to investigate the economic effectiveness of coal-fired power plants working under maximum steam conditions and to define the limits of technical feasibility for large outputs. For this purpose, the design data for components exposed to high thermal and compressive stresses were determined. It will be demonstrated that hard-coal-fired power plants with a rating of up to 1000 MW and maximum steam conditions of 300 bar/600°C are, in principle, technically feasible. Problems especially in respect of the weldability, the manufacture of shaped parts (e.g. pipe bends and branches) and the testability of piping systems constitute the limits of technical feasibility. Application in the base-load range provides an economic incentive for the construction of power plants of this kind. But as for hard coal power plants the application in the medium-load range is more likely, this advantage is not practicable at the moment. With this operating mode, the start-up times and rates of load change, affected by the high steam conditions, must be given greater consideration.

48954 **(BMFT-FB-T—83-045) Development of wear resistant gas turbines downstream of a pressurized fluidized-bed combustor.** Rukes, B. (Bundesministerium fuer Forschung und Technologie, Bonn (Germany, F.R.)). Apr 1983. 162p. (In German). NTIS (US Sales Only), PC A08/MF A01. Order Number DE83751094.

The development of a wear-resistant gas turbine, suitable for use in the aggressive gas atmosphere downstream of a pressurized

fluidized bed combustor, is to be studied by applying a step by step program. The particular parameters which influence the wear characteristics of gas turbine blades in strongly erosive and corrosive gas atmospheres were investigated in the first step just completed. The results of the extensive evaluations of the subject literature and of the latest developments and experience demonstrate that it is fundamentally possible, with a corresponding hot gas cleanup system, to construct a wear resistant gas turbine. But this must be confirmed by tests in the next step before commencement of the gas turbine design. Therefore a plan has been prepared for heating tests, wear-test-facility tests and blade cooling tests. This planning work was focussed on the complete new design of the wear-test facility which is to permit the study of the combined erosion/corrosion attack on a rotating specimen-carrying disk.

48955 **(BMFT-FB-T—83-054) Direct-condensation of humidity in air in thermal power stations.** Schwab, S.; Schiebelsberger, B. (Bundesministerium fuer Forschung und Technologie, Bonn (Germany, F.R.)). Apr 1983. 78p. (In German). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83751095.

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1. Objective. The practicability of direct condensation of humidity in air (DKFL) for waste heat removal from thermal power plants was investigated with regard to technical, economical and environmental aspects. 2. Research Programme. a) Reference-investigations at the installed experimental plant. b) Construction and installation of a new vertical tube bundle with two sections of different pipe diameters. c) Parameter variation at the demonstration plant for investigations of mass and heat transfer phenomena. d) Experimental evaluation of the influence of all physical and technical parameters on the performance of the DKFL. e) Summary and correlation of the collected data by computer programme. 3. Result. The theoretical, technical and economical data for the design of hybrid cooling systems by DKFL were collected and finaly valued.

48956 **(EPRI-EA—3015) Selected papers on fuel forecasting and analysis.** Gordon, R.L.; Prast, W.G. (eds.). (Pennsylvania State Univ., University Park (USA); Atlantis, Inc., Green's Farms, CT (USA)). May 1983. 270p. (CONF-811285—Exc.). NTIS, PC A12/MF A01. Order Number DE83902648.

From EPRI fuel supply seminar; Memphis, TN, USA (8 Dec 1981).

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Of the 19 presentations at this seminar, covering coal, uranium, oil, and gas issues as well as related EPRI research projects, eleven papers are published in this volume. Nine of the papers primarily address coal-market analysis, coal transportation, and uranium supply. Two additional papers provide an evaluation and perspective on the art and use of coal-supply forecasting models and on the relationship between coal and oil prices. The authors are energy analysts and EPRI research contractors from academia, the consulting profession, and the coal industry. A separate abstract was prepared for each of the 11 papers.

48957 **(NP—3770318) Application and experimental verification of the simulation with the semianalytical method of solution in a forced-convection steam generator with superposed circulation.** Kley, J. (Stuttgart Univ. (Germany, F.R.). Fachbereich Energietechnik). 19 Mar 1982. 94p. (In German). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83770318.

Thesis.

For a forced-convection steam generator with superposed circulation a simulation model is set up according to the semianalytical method of calculation and tested by means of an experimental steam generator. The degree of correspondence is shown for the steam generator and the superheaters in the static and the pressure-dynamic range. In particular, the influence of the pressure behavior in the two-phase region and of the heat-storing phenomena is studied.

2002 Environmental Aspects

REFER ALSO TO CITATION(S) 49137, 49276, 49830

48958 **(PB—83-179051) Bibliography of the Maryland Power Plant Siting Program, fourth edition.** Magette, T. (Maryland Dept. of Natural Resources, Annapolis (USA). Power Plant Siting Program). Jan 1983. 62p. NTIS, PC A04/MF A01.

The Maryland Power Plant Siting Act of 1971 established the Power Plant Siting Program to insure that demands for electric power would be met in a timely manner at a reasonable cost while assuring that the associated environmental impact would be acceptable. The scope of the Program extends to estimating the impact of proposed new generating facilities, evaluating the acceptability of proposed transmission line routes assessing the impact of existing generating facilities, acquiring sites for utilities unable to find a suitable site for generation, and investigating generic issues related to power plant site evaluation and associated environmental and land use considerations.

2003 Power Transmission And Distribution

REFER ALSO TO CITATION(S) 49519

21 NUCLEAR POWER PLANTS

REFER ALSO TO CITATION(S) 49202, 49212

48959 **(INIS-mf—7931) Quality assurance/quality control, reliability and availability of nuclear power plants.** Kueffer, K. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1981. 14p. (CONF-8010323—31). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780733.

From IAEA interregional training course on quality assurance; Karlsruhe, F.R. Germany (27 Oct 1980).

In a first part this lecture will present a survey on nuclear power production and plant performance in the Western World and discuss key parameters such as load factors and non-availability. Some main reasons for reliable performance of nuclear power plants are given. The second part of this lecture deals with the question how quality assurance and quality control measures directly influence plant reliability, availability and, thus, economy. Derived from worldwide experience gained from operating nuclear power plants, it may be concluded that the implementation of an overall quality assurance programme does not only satisfy safety requirements set forth by the nuclear regulatory bodies, but has also a considerable impact on plant reliability and availability. A positive effect on these figures will be achieved if the established quality assurance programme provides for a coordinated approach to all activities affecting quality. It is discussed how the quality of a product should be controlled and what kind of quality assurance measures by performed examples are given to demonstrate that the expenditure for maintenance work on components will decrease if planned and systematic quality assurance actions have been implemented during all procurement stages. (orig./RW).

48960 **(INIS-mf—7944) Survey of different reactor types.** Heinzel, V. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 41p. (CONF-821039—25). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780734.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

The present paper deals with the following topics: - General lay-out of the primary and secondary circuits of the different reactor types - core lay-out - plant control - control rod arrangements, reactor building, fuel reload system - survey on the world market of nuclear power plants. (orig./RW).

48961 **(INIS-mf—7965) Current research and development at the Nuclear Research Center Karlsruhe.** Kuesters, H. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 17p. (CONF-821039—33). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780801.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

Since 1960 a major activity of KfK is R and D work for the design of fast breeder reactors, including material research, physics, and safety investigations; a prototype of 300 MWe is under construction now in the lower Rhine Valley. For enrichment of ^{235}U fissile material KfK developed the separation nozzle process; its technical application is realized within an international contract between the Federal Republic of Germany and Brazil. Within the frame of the European Programme on fusion technology KfK develops and tests superconducting magnets for toroidal fusion systems; a smaller activity deals with research on inertial confinement fusion. A broad research programme is carried through for safety investigations of nuclear installations, especially for PWRs; this activity is supplemented by research and development in the field of nuclear materials' safeguards. Development of fast reactors has to initiate research for the reprocessing of spent fuel and waste disposal. In the pilot plant WAK spent fuel from LKWs is reprocessed; research especially tries e.g. to improve the PUREX-process by electrochemical means, vitrification of high active waste is another main activity. About 1/3 of the research capacity of KfK deals with fundamental research in nuclear physics, solid state physics, biology and studies on the impact of technology on environment.

48962 **(INIS-mf—7966) Status of nuclear power in developing countries. Role of the IAEA.** Laue, H.J. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 22p. (CONF-821039—31). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780769.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

In the context of the world-wide energy situation and the key position energy plays and will play for the economic and social development of any country, the energy demand situation up to the year 2000 is analysed. As a result, the world-wide energy demand will continue to increase, however, mainly in the developing world. Nuclear power is one of the important component in the energy mix of today and in the future. Status of nuclear power application in developing countries up to the end of the century. Any further growth of the peaceful use of nuclear power in developing countries is closely linked with the following requirements: - qualified manpower, - industrial infrastructure, - energy demand and supply assessments, - high investments, - assurance of supply of nuclear fuel and fuel cycle services, - availability of small and medium power reactors. The possible role of the IAEA in developing countries and international measures to remove some of the limitations for the peaceful use of nuclear energy in developing countries are discussed. (orig.).

48963 **(INIS-mf—7981) Design of an information and documentation center for the Peruvian Institute of Nuclear Energy.** de Lopez Castilla, D.I. (Instituto Peruano de Energia Nuclear, Lima. Centro de Informacion y Documentacion). 1981. 9p. (In Spanish). (CONF-8111150—1). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780798.

From 2. national congress on library and information science; Lima, Peru (9 Nov 1981).

The first steps in the formation of the Center are described, corresponding with the reorganization of the library which was included. Afterwards, the activities and the physical units are described which are established for this purpose. (author).

48964 **(INIS-mf—7999) Quality assurance records and records' system.** Link, M.; Martinek, J. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 18p. (CONF-8010323—41). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780799.

From IAEA interregional training course on quality assurance; Karlsruhe, F.R. Germany (27 Oct 1980).

For nuclear power plants extensive proof of quality is required which has to be documented reliably by quality records. With respect to the paper volume it is the most comprehensive 'curriculum vitae' of the technique. Traditional methods of information and recording are unsatisfactory for meeting regulatory requirements for maintaining the QA-aspects of status reporting, completeness, traceability and retrieval. Therefore KWU has established a record (documentation) subsystem within the overall component qualification system. Examples of the general documentation requirements, the procedure and handling in accordance with this subsystem for mechanical equipment are to be described examplarily. Topics are: - National and international requirements - Definition of QA records - Modular and product orientated KWU-record subsystem - Criteria for developing records - Record control, distribution, collection, storage - New documentation techniques (microfilm, data processing) - Education and training of personnel. (orig./RW).

48965 **(INIS-mf—8005) Quality assurance during operation of a nuclear power plant.** Stolz, J. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 13p. (CONF-8010323—32). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780735.

From IAEA interregional training course on quality assurance; Karlsruhe, F.R. Germany (27 Oct 1980).

The lecture provides a description of the QA manual as operated in French nuclear power plants. Oral comments will include discussion of some difficulties in actual implementation. Also examples will be given of incidents in nuclear plants, which could have been mitigated or fully prevented by QA attitude. (orig./RW).

48966 **(INIS-mf—8006) Quality assurance organization of the plant owner.** Staebler, K. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 13p. (CONF-8010323—33). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780736.

From IAEA interregional training course on quality assurance; Karlsruhe, F.R. Germany (27 Oct 1980).

It is not the primary task of the plant owner to assure the quality during erection. It is, however, his responsibility to check the quality assurance system established by the plant, the supplier and the subcontractor. In the lecture, it is shown that the plant owners do this control in the best efficient way. The special consideration of the plant owner in deciding questions of quality assurance is demonstrated by special examples. The meaning of basic safety for the plant owner is presented. (orig./RW).

48967 **(INIS-mf—8008) QA manpower requirement for nuclear power plants.** Link, M. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 15p. (CONF-8010323—34). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780737.

From IAEA interregional training course on quality assurance; Karlsruhe, F.R. Germany (27 Oct 1980).

To ensure the quality of the plant, QA activities are to be performed by the owner, the main contractor, the subcontractors and the Licensing Authority. The responsibilities of the QA-personnel of these organizations comprise as a minimum the control of the quality assurance systems and the proof of the quality requirements. Numbers of the required QA-personnel, designated for different tasks and recommended educational levels and professional qualifications will be given. (orig./RW).

48968 **(INIS-mf—8013) Management control and quality assurance during plant operation.** Modemann, G.; Ettemeyer, R.; Stephan, W. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 19p. (CONF-8010323—35). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780738.

From IAEA interregional training course on quality assurance; Karlsruhe, F.R. Germany (27 Oct 1980).

The present paper deals with basic aspects of quality assurance for owners of nuclear power plants, with quality assurance for plant operation and with consequences from KTA regulatory requirements. (RW).

48969 **(INIS-mf—8014) Operational experience with nuclear power plants - outage statistics, causes and effects.** Kutsch, W.110Operational experience with nuclear power plants - outage statistics, causes and effects. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 14p. (CONF-8010323—36). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780739.

From IAEA interregional training course on quality assurance; Karlsruhe, F.R. Germany (27 Oct 1980).

Whether operating experience is good or bad is not a question of the subjective impression. Availability, reliability, environmental influence, safety and economy are of a significance which cannot be expressed by figures. To what extent the result may be called good or bad can be noticed by comparing the results with the projected expected values or by comparing them with other plants locally or overseas. (orig.).

48970 **(INIS-mf—8019) Operational experience, availability and reliability of nuclear power plants.** Kueffer, K. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 16p. (CONF-8009308—15). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780740.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

This lecture - presents a survey on nuclear power production and plant performance in the Western World covering all reactor types and light-water reactors in particular and discusses key parameters such as load factors and non-availability analysis. - outlines the main reasons for the reliable performance of Swiss nuclear power plants - quality equipment - operator qualification and training - engineering know how on site - maintenance philosophy and outage planning - information system and feedback of experience - explains the management functions as applied at the Beznau Nuclear Power Station to ensure high power productivity and reliability - improvement - a feedback control system - analysis of production losses - optimization in shut-down planning - minimizing disturbances during plant operation - optimizing personnel qualification and efficiency. (orig.).

48971 **(INIS-mf—8041) Decree No 82-430 of 19 May 1982 publishing the Co-operation Agreement between the Government of the French Republic and the Government of the Egyptien Arab Republic on the Peaceful Uses of Nuclear Energy (with two Annexes), signed in Paris on 27 March 1981.** 26 May 1982. 5p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780772.

Published in the French Official Gazette.

This framework agreement which came into force on 21 July 1981, provides for the contribution by France to the Egyptian nuclear power programme, in particular by technology transfer, contracts for nuclear power plant construction, supply of nuclear equipment and materials etc. (NEA).

48972 **(INIS-mf—8042) Decree No 82-701 of 29 July 1982 publishing the Co-operation Agreement between the Government of the French Republic and the Government of the Republic of Bangladesh on the Peaceful Uses of Nuclear Energy signed in Paris on 29 August 1980.** 10 Aug 1982. 3p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780773.

Published in the French Official Gazette.

This framework agreement which came into force on 29 August 1980, provides for the contribution by France to the nuclear programme of Bangladesh, in particular by technology transfer, contracts for nuclear power plant construction, supply of nuclear equipment and materials etc. (NEA).

48973 **(NUREG—0390-Vol.7-No.1) Topical report review status, July 15, 1983. Vol. 7, No. 1.** (Nuclear Regulatory Commission, Washington, DC (USA). Office of Resource Management). Aug 1983. 207p. NTIS, PC A10/MF A01 - GPO. Order Number DE83902763.

A Topical Report Review Status is scheduled to be published semi-annually. The primary purpose of this document is to provide periodic progress reports of on-going topical report reviews, to identify those topical reports for which the Nuclear Regulatory Commission (NRC) staff review has been completed and, to the extent practicable, to provide NRC management with sufficient information regarding the conduct of the topical report program to permit taking whatever actions deemed necessary or appropriate. This document is also intended to be a source of information to NRC Licensing Project Managers and other NRC personnel regarding the status of topical reports which may be referenced in applications for which they have responsibility.

48974 **(NUREG/CR—2669) Front-end analysis for the nuclear-power-plant maintenance-personnel reliability model.** Siegel, A.I.; Bartter, W.D.; Wolf, J.J.; Knee, H.E.; Haas, P.M. (Oak Ridge National Lab., TN (USA); Applied Psychological Services, Inc., Wayne, PA (USA)). Aug 1983. Contract W-7405-ENG-26. 154p. (ORNL/TM—8300). NTIS, PC A08/MF A01 - GPO. Order Number DE83016657.

The front-end analysis performed for the Nuclear Power Plant Maintenance Personnel Reliability Modeling Program consisted of three primary tasks which are addressed within this report. The first of these was a front-end user survey which investigated the need for and potential content of a structured methodology for nuclear power plant maintenance. For this survey, personal interviews and mail surveys were completed to collect the needed information. The second task of the front-end analysis assessed available human behavioral methodologies for applicability and adaptability potential for nuclear power plant maintenance activities. The third task of the front-end analysis was the development of a comprehensive program plan for the simulation model. The plan that was developed spans a 38-month period, and includes three phases: the model development phase, which will result in the release of a debugged/sensitivity tested/calibrated version of the model; the validation phase, which will result in the release of a validated version of the model; and the dissemination phase.

2101 Power Reactors, Non-breeding, Light-water Moderated, Boiling Water Cooled

REFER ALSO TO CITATION(S) 48731, 49017, 49035, 49134, 49162, 49176, 49178, 49181, 49183, 49184, 49187, 49190, 49192, 49200, 49204, 49205, 49206, 49207, 49208, 49209, 49210, 49211, 49503, 50290

48975 **(DOE/TIC—8200-R47) Nuclear reactors built, being built, or planned in the United States.** Goulden, A.M. (ed.). (USDOE Technical Information Center, Oak Ridge, TN). Aug 1983. 51p. (PB—83903001). NTIS, PC A04/MF A01. Order Number DE83007090.

This semiannual compilation provides current information about facilities for domestic use or export which are capable of sustaining a nuclear chain reaction. Civilian, production, and military reactors are listed, as are reactors for export and critical assembly facilities. Information given includes location, owner, principal nuclear contractor, type, power rating, docket number, and start-up and shutdown dates. Nuclear Reactors Built, Being Built, or Planned is also available on standing order (PB83-903000) through a deposit account with the National Technical Information Service, Springfield, VA 22161.

48976 (ECN—127) Irradiation performance and post-irradiation examinations of the instrumented sphere-pac UO_2 assembly IFA-204, irradiated up to 1.7% FIMA in the Halden Boiling Water Reactor. van der Linde, A. (Stichting Energieonderzoek Centrum Nederland, Petten). Dec 1982. 188p. NTIS (US Sales Only), PC A09/MF A01. Order Number DE83702330.

Fuel assembly IFA-204 consisted of four pins filled with a blend of three sizes of UO_2 spheres. This blend was compacted in the zircaloy-4 cladding tube by vibration to achieve a 87-88% T.D. smear density of the 1500 mm long sphere-pac fuel column. IFA-204 was irradiated during 597 days, equivalent to 436 full power days, in the Halden BWR from November 1971 to April 1974 when the achieved assembly average burnup amounted to 13.7 MWd/kg UO_2. Two of the four pins were equipped with fuel column length and pin length extensometers. The measurements showed that at average pin powers less than about 25 $kW.m^{-1}$ only fuel-clad-thermal-interaction, FCTI, occurred. The clad thermal expansion coefficient was 4.8 $ppm/kW.m^{-1}$. For calculations of the irradiation behaviour of sphere-pac LWR pins, filled with 0.1 MPa helium, with the Gapcon-Thermal-2 code a new thermal conductivity-temperature relationship has been developed. The calculated data agreed reasonably well with the measured data when taking into account a restructured fuel density of 90% T.D., a fuel surface roughness of 1 μm, the absence of a fuel-cladding gap and an effective full power fuel restructuring time of 40 days. It is concluded that the porous structure of the sphere-pac fuel column, whether restructured or not, has the inherent disadvantage of a high mobility of gaseous fission products and the inherent advantage of a practically stress free operation of the cladding.

48977 (INIS-mf—7932) Comparison between a dynamic hard-wired and a computerized reactor protection system in view of technical safety aspects. Buettner, W.E. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 34p. (CONF-821039—8). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780710.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

There exists no uniform test and maintenance strategy for instrumentation and control in German nuclear power plants. The procedures vary according to the plant type (PWR or BWR), the utility and the licensing authority responsible for the plant. But there are common aspects and also requirements from regulatory guides. The test and maintenance strategies and practices will be shown exemplarily for some safety related control and instrumentation systems. Technical and administrative procedures to check the control and instrumentation together with the mechanical components by testing the function of the systems or by simulation, or by testing the electronic modules in situ will be described. The test-range often depends on the test intervall, so different case will be discerned. (RW).

48978 (INIS-mf—8015) In-service inspection and periodic testing. Eisele, H.; Meyer, F.A.; Zipser, R.R. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 48p. (CONF-8010323—30). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780732.

From IAEA interregional training course on quality assurance; Karlsruhe, F.R. Germany (27 Oct 1980).

In-service inspections are performed to verify the operational safety, and maintenance work is performed to guarantee the availability. In the present paper, the typical in-service inspections of a light-water reactor NPP (operated on a pressurized-water reactor/PWR/ or on a boiling-water reactor/BWR/) are described with details and examples of typical inspections, especially of recurrent performance tests of the systems. (orig./RW).

48979 (INIS-mf—8125) Core cooling systems. Hoeppner, G. (Gesellschaft fuer Reaktorsicherheit m.b.H. (GRS), Garching (Germany, F.R.)). (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 9p. (CONF-8009308—43). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702805.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

The reactor cooling system transports the heat liberated in the reactor core to the component - heat exchanger, steam generator or turbine - where the energy is removed. This basic task can be performed with a variety of coolants circulating in appropriately designed cooling systems. The choice of any one system is governed by principles of economics and natural policies, the design is determined by the laws of nuclear physics, thermal-hydraulics and by the requirement of reliability and public safety. PWR- and BWR- reactors today generate the bulk of nuclear energy. Their primary cooling systems are discussed under the following aspects: 1. General design, nuclear physics constraints, energy transfer, hydraulics, thermodynamics. 2. Design and performance under conditions of steady state and mild transients; control systems. 3. Design and performance under conditions of severe transients and loss of coolant accidents; safety systems.

48980 (JAERI-M—82-034) Fuel centerline temperature measurement experiment in JMTR, (3). Post-irradiation examination of the first test assembly. Sakai, H.; Nakakura, Y.; Nakagawa, T. (Japan Atomic Energy Research Inst., Tokyo). Apr 1982. 61p. (In Japanese). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702427.

Fuel centerline temperature measurement experiment was planned using in-pile water loop (OWL-1) in JMTR for the LWR fuel safety study. In this program, the irradiation of three fuel assembly are planned and post-irradiation examination of the first test assembly was completed. The first test assembly consists of four fuel rods (BWR type) which have different fuel-cladding gap parameters each other and has been measured fuel centerline temperature, pressure of fission product gases in the plenum, elongation of the cladding and the others by in-pile instrumentation. The purpose of post-irradiation examination is to obtain useful data that can confirm the instrumentation data. In this paper, the result of visual inspection, X-ray radiography, gamma scanning, profilometry, eddy current testing, residual gap measurement, plenum gas pressure measurement, gas analysis and metallography are described.

48981 (UCID—19716) Technical-evaluation report on the proposed technical-specification changes for the inservice surveillance of safety-related hydraulic and mechanical snubbers at the James A. Fitzpatrick Nuclear Power Plant (Docket No. 50-333). Selan, J.C. (Lawrence Livermore National Lab., CA (USA)). 18 Aug 1983. Contract W-7405-ENG-48. 12p. NTIS, PC A02/MF A01. Order Number DE83016612.

This report documents the technical evaluation of the proposed Technical Specification changes to Limiting Conditions for Operation, Surveillance Requirements and Bases for safety-related hydraulic and mechanical snubbers at the James A. FitzPatrick Nuclear Power Plant. The evaluation is to determine whether the proposed Technical Specifications are in conformance with the model Standard Technical Specification set forth by the NRC. A check list, Appendix A of this report, compares the licensee's submittal with the NRC requirements and includes Proposed Resolution of the Deviations.

48982 (UCID—19717) Technical-evaluation report on the proposed technical-specification changes for the inservice surveillance of safety-related hydraulic and mechanical snubbers at the Peach Bottom Atomic Power Station, Units 2 and 3 (Docket Nos. 50-277, 50-278). Selan, J.C. (Lawrence Livermore National Lab., CA (USA)). 18 Aug 1983. Contract W-7405-ENG-48. 12p. NTIS, PC A02/MF A01. Order Number DE83016676.

This report documents the technical evaluation of the proposed Technical Specification changes to Limiting Conditions for Operation, Surveillance Requirements and Bases for safety-related hydraulic and mechanical snubbers at the Peach Bottom Atomic Power Station, Units 2 and 3. The evaluation is to determine whether the proposed Technical Specifications are in conformance with the model Standard Technical Specification set forth by the NRC. A check list, Appendix A of this report, compares the licensee's submittal with the NRC requirements and includes Proposed Resolution of the Deviations.

48983 **Improvements in GE BWR fuel design and performance.** Fischer, D.L. (General Electric Company, Nuclear Energy Division, 175 Curtner Avenue, San Jose, CA 95125). *Transactions of the American Nuclear Society;* **43**: 154-155(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

2102 Power Reactors, Non-breeding, Light-water Moderated, Non-boiling Water Cooled

REFER ALSO TO CITATION(S) 48975, 48977, 48978, 48979, 49017, 49035, 49037, 49043, 49084, 49092, 49095, 49096, 49120, 49124, 49133, 49134, 49148, 49149, 49151, 49152, 49153, 49155, 49170, 49171, 49174, 49176, 49177, 49178, 49179, 49182, 49183, 49184, 49185, 49186, 49187, 49188, 49190, 49193, 49194, 49195, 49196, 49197, 49198, 49199, 49200, 49203, 49204, 49205, 49206, 49207, 49208, 49209, 49210, 49211, 49213, 49215, 49910

48984 **(BNL-NUREG—33385) Mechanism of TMI-1 steam-generator failures.** Newman, R.C.; Bandy, R.; Roberge, R. (Brookhaven National Lab., Upton, NY (USA)). 1983. Contract AC02-76CH00016. 22p. (CONF-830845—1). NTIS, PC A02/MF A01 - GPO. Order Number DE83015770.

From Environmental degradation of materials in nuclear power systems-water reactors; Myrtle Beach, SC, USA (22 Aug 1983).

The low-temperature stress-corrosion cracking (SCC) of sensitized Inconel 600 was studied using various borated solutions of sulfur compounds. Sodium thiosulfate and sodium tetrathionate were equally aggressive provided that the alloy was sufficiently severely sensitized. Tetrathionate was more effective on marginally sensitized material. The threshold concentration of thiosulfate was below 10^{-6} M. LiOH additions inhibited SCC. Oxygen is necessary for SCC in these solutions. The relevance of the laboratory tests to the steam generator failures is discussed.

48985 **(DOE/ET/34212—35) TMI-2 gadolinia demonstration assembly technical report.** Newman, L.W.; Jones, H.M.; Thornton, T.A.; Wittkopf, W.A.; Aldrich, M.E.; Dalmas, T.H.; Connell, J.D. (Babcock and Wilcox Co., Lynchburg, VA (USA). Utility Power Generation Div.; Babcock and Wilcox Co., Lynchburg, VA (USA). Research and Development Div.). Jul 1983. Contract AC02-78ET34212. 75p. (BAW—1703). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83016095.

Four demonstration assemblies, each containing four UO_2-Gd_2O_3 fuel rods, were irradiated to approximately 3000 MWd/mtU in cycle 1 of the Three Mile Island - Unit 2 pressurized water reactor. The UO_2-Gd_2O_3 fuel rods initially contained enrichments of 1.80 wt % ^{235}U and 3.0 wt % Gd_2O_3 in UO_2. This report describes the reactor core and presents data on the performance of UO_2-Gd_2O_3 fuel during its early incore residence. Core power distributions are presented, which were monitored using both fixed rhodium and movable gadolinium incore self-powered neutron detectors. Other data presented are reactor coolant soluble boron concentrations and control rod worths. The data accumulated during the irradiation of the demonstration assemblies indicated that the UO_2-Gd_2O_3 fuel operated well, with no anomalies that would adversely affect fuel performance during further irradiation.

48986 **(EPRI-NP—3063-CCM-Vol.2) Numerical simulation of steam separators used in nuclear steam generators and reactor systems. Volume 2. User's manual.** Vander Vorst, M.J. (JAYCOR, San Diego, CA (USA)). Jun 1983. 80p. NTIS, PC E05/MF A01. Order Number DE83902944.

Includes 4 sheets of 48x reduction microfiche.

This two-volume report describes the analytic models and the computational techniques for model solution that were used to study the two-phase flow through steam separators. Calculations for the flow through Combustion Engineering, Inc., and Westinghouse Electric Corporation primary steam separators using postulated flow conditions are given as examples. Volume 1 deals with the analytic development of the SWIRL code; volume 2 is a computer code manual for that code.

48987 (INIS-BR—05, pp vp) **Operating experience with PWR in the FRG (Federal Republic of Germany).** Cramer, H. (Nordwestdeutsche Kraftwerke A.G., Hamburg (Germany, F.R.)). Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

Operating experiences with PWR's in the Federal Republic of Germany has been exclusively with KWU turnkey power plants with U tube steam generators. Such experience started with the 345 MW Obrigheim plant in 1968 and includes the 670 MW Stade plant, the 1200/1300 MW Biblis plants, The 900 MW Neckarwestheim and the 1300 MW Unterweser plants.

48988 (INIS-BR—05, pp vp) **Guidelines for PWR safety research and development at NUCLEBRAS.** Pinheiro, R.B. (Centro de Desenvolvimento da Tecnologia Nuclear, Belo Horizonte (Brazil)). Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

A review of the main areas of research developed at the Centro de Desenvolvimento da Tecnologia Nuclear (CDTN) is presented, as well as its interchange programs with Germany for personned training.

48989 (INIS-BR—05, pp vp) **FURNAS activities in safety and quality assurance.** Dezordi, W.L.; Correa Filho, S.M.; Sacco, W.; Morais, L.H.G. de (FURNAS, Rio de Janeiro (Brazil)). Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

The aspects involved in the quality assurance performed by FURNAS for Nuclear Power Plant - Angra Unit I, are shown. Furnas' responsibilities in the licensing regarding reactor safety are also discussed. A summary of the computer codes used in the licensing process is given.

48990 **(INIS-mf—7945) Functional systems of a pressurized water reactor.** Heinzel, V. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 23p. (CONF-821039—26). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780742.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

The main topics, discussed in the present paper, are: - Principle design of the reactor coolant system - reactor pressure vessel with internals - containment design - residual heat removal and emergency cooling systems - nuclear component cooling systems - emergency feed water systems - plant electric power supply system. (orig./RW).

48991 **(INIS-mf—7952) Water systems.** Riess, R. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 17p. (CONF-821039—27). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780743.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

The present paper describes the coolant chemistry and its consequences for 1300 MWsub(e) KWU PWR plants. Some selected systems, i.e. primary heat transport system, steam water cycle and cooling water arrangements, are chosen for this description. Various aspects of coolant chemistry regarding general corrosion, selective types of corrosion and deposits on heat transfer surface have been discussed. The water supply systems necessary to fulfill the requirements of the coolant chemistry are discussed as well. It has been concluded that a good operating performance can only be achieved when - beside other factors - the water chemistry has been given sufficient consideration. (orig.).

48992 (INIS-mf—7971) Concept differences between German and American pressurized water reactors and their effects upon the adaption of the USAEC safety standard to German conditions. Lempert, J. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 40p. (CONF-8009308—16). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780744.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

The difficulties which have been encountered in licensing a U.S. concept in the FRG are shown on hand of the essential differences between the nuclear power plants Muelheim-Kaerlich (FRG) and TMI-2 (USA). The difference in concept is a result of justified efforts in Germany in striving for more safety, which is also reflected in the scope of the documentation supplementing the safety analysis report for the licensing procedure. Because of the differences in requirements between the U.S. and Germany as well as the difference in the licensing procedure, a reconciling of current U.S. and German practices and, therefore, a standardization of the safety analysis is very difficult. In conclusion, some possible ways of integrating German and American nuclear power plant technology is presented. (orig.).

48993 (INIS-mf—7976) Overall plant design of PWRs. Safety related structures, components, equipment and systems. Meyer, P.J. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 50p. (CONF-8009308—17). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780745.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

The present paper deals with the safety related components of a PWR, especially with the different mechanical active safety systems (residual heat removal, emergency feedwater and emergency diesel systems, borrating system etc.); the reactor protection systems and; the radiation monitoring system. (RW).

48994 (INIS-mf—8009) Surveillance systems (PWR) - loose parts monitoring - vibration monitoring - leakage detection. Schuette, A.; Blaesig, H. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 33p. (CONF-821039—22). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780729.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

The contribution is engaged in the task and the results of the loose parts monitoring and the vibration monitoring following from the practice at the PWR of Biblis. First a description of both systems - location and type of the sensors used, the treatment of the measurements and the indications - is given. The results of the analysis of some events picked up by the surveillance systems are presented showing applicabilty and benefit of such systems. (orig.).

48995 (INIS-mf—8120) Water systems. Riess, R. (Kraftwerk Union A.G., Erlangen (Germany, F.R.)). (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 53p. (CONF-8009308—46). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702810.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

The present paper describes the coolant chemistry and its consequences for 1300 MWsub(e) KWU PWR plants. Some selected systems, i.e. primary heat transport system, steam water cycle and cooling water arrangements, are chosen for this description. Various aspects of coolant chemistry regarding general corrosion, selective types of corrosion and deposits on heat transfer surfaces have been discussed. The water supply systems necessary to fulfill the requirements of the coolant chemistry are discussed as well. It has been concluded that a good operating performance can only be achieved when - beside other factors - the water chemistry has been given sufficient consideration.

48996 (INIS-mf—8131, pp vp) Investigations on the phase of CPSD between detectors in the Borssele PWR power plant at low frequencies. Por, G. (Hungarian Academy of Sciences, Budapest. Central Research Inst. for Physics:. 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

48997 (INIS-mf—8131, pp vp) Special noise measurement at Borssele reactor (PWR). Tuerkcan, E. (Netherlands Energy Research Foundation, Petten:. 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

48998 (INIS-mf—8131, pp vp) Demonstration of an automated noise surveillance system in a PWR. Smith, C.M. (Oak Ridge National Lab., TN (USA)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

48999 (LA—9837-MS) Calculated response contributions of gamma rays emitted from fuel pins in an irradiated PWR fuel assembly. Phillips, J.R.; Bosler, G.E. (Los Alamos National Lab., NM (USA)). Aug 1983. Contract W-7405-ENG-36. 21p. NTIS, PC A02/MF A01. Order Number DE83016357.

The relative contributions of gamma rays originating in specific fuel pins to the total gamma-ray source strength were calculated as a function of initial gamma-ray energy for a pressurized-water-reactor fuel assembly. Gamma-ray energies used in the calculations ranged from 511 to 2186 keV, the energy range in which most long-lived fission and activation products emit gamma rays. Nondestructive gamma-ray measurement techniques use specific signatures of ^{137}Cs or $^{134}Cs/^{137}Cs$ and $^{154}Eu/^{137}Cs$ isotopic ratios to determine the exposures of irradiated fuel assemblies. Nearly 92% of the measured ^{137}Cs signature (661.6 keV) originates in the three outer rows of fuel pins. However, because only 78% of the ^{154}Eu signature (1275 keV) originates in these three outer rows, a ratio of $^{154}Eu/^{137}Cs$ does not sample exactly the same volume segment of the fuel assembly. Other examples are presented that evaluate the effect of using a collimator at different angular orientations on quantifying the contributions from specific fuel pins to the total source strength.

49000 (SKI-B—36-82) Application of radal gamma thermometer assemblies for coolant monitoring in Ringhals W-PWRs. Smith, R.D.; Romslo, K.; Moen, Oe. (Statens Kaernkraftinspektion, Stockholm (Sweden)). Jul 1982. 171p. NTIS (US Sales Only), PC A08/MF A01. Order Number DE83702332.

A study has been carried out investigating how Radcal Gamma Thermometers (RGTs) can be used for coolant inventory and core cooling monitoring in the Ringhals Westinghouse PWRs. The study concludes that two types of RGT rods would be required to come up with a complete solution covering both coolant inventory and core cooling monitoring. Above-core RGT rods will be installed in the guide tubes housing the outlet thermocouples. The Above-Core RGT rod is designed with 8 sensors where 4 are located in the upper head and 4 in the plenum. This rod will give an early warning about loss of coolant or void formation in the space from top of fuel to the reactor lid. A ninth thermocouple in this rod will measure the core outlet temperature as did the thermocouple the RGT rod replaced. The Above-Core RGT rods will give an early warning about approach to Inadequate Core Cooling (ICC) by measuring the collapsed water level inside the thermocouple guide tube. Four such rods are recommended per reactor. In-Core RGT rods are inserted from the seal table. These rods will give the information required for intelligent accident management in case ICC has developed. The signals obtainable from the rods will give direct information about fuel decay heat, core heat trans-

fer conditions, core temperature and core coolant water level. The In-Core RGT rods can be used for local power monitoring during normal operation.

49001 **(UCID—19711) Technical-evaluation report on the adequacy of station electric-distribution-system voltages for the H.B. Robinson Steam Electric Plant, Unit 2 (Docket No. 50-261).** Selan, J.C. (Lawrence Livermore National Lab., CA (USA)). 22 Jul 1983. Contract W-7405-ENG-48. 14p. NTIS, PC A02/MF A01. Order Number DE83015782.

This report documents the technical evaluation of the adequacy of the station electric distribution system voltages for the H.B. Robinson Steam Electric Plant, Unit 2. The evaluation is to determine if the onsite distribution system in conjunction with the offsite power sources has sufficient capacity to automatically start and operate all Class 1E loads within the equipment voltage ratings under certain conditions established by the Nuclear Regulatory Commission. The analyses submitted demonstrated that the station's electric distribution system will supply adequate voltage to the Class 1E equipment for the worst-case conditions analyzed.

49002 **(UCID—19712) Technical-evaluation report on the proposed technical-specification changes on degraded grid-voltage protection for the Rancho Seco Nuclear Generating Plant (Docket No. 50-312).** Selan, J.C. (Lawrence Livermore National Lab., CA (USA)). 1 Aug 1983. Contract W-7405-ENG-48. 16p. NTIS, PC A02/MF A01. Order Number DE83016684.

This Technical Evaluation Report is a revision and contains supplemental information to the Technical Evaluations documented in previous LLNL reports dated October 1980 (UCID-18690), November 10, 1981 (UCID-19113), and July 15, 1983 (UCID-19708). These reports encompass the NRC requirements on Degraded Grid Voltage Protection and Adequacy of Station Electric Distribution System Voltages. The evaluation finds that the proposed Technical Specification changes on the undervoltage/overvoltage trip setpoints and Limiting Conditions for Operation provide the required protection to the Class 1E Equipment from sustained abnormal voltages.

49003 **(UCID—19713) Technical-evaluation report on the proposed technical-specification changes for the inservice surveillance of safety-related hydraulic and mechanical snubbers at the Maine Yankee Nuclear Power Plant (Docket No. 50-309).** Selan, J.C. (Lawrence Livermore National Lab., CA (USA)). 18 Aug 1983. Contract W-7405-ENG-48. 13p. NTIS, PC A02/MF A01. Order Number DE83016611.

This report documents the technical evaluation of the proposed Technical Specification changes to Limiting Conditions for Operation, Surveillance Requirements and Bases for safety-related hydraulic and mechanical snubbers at the Maine Yankee Nuclear Power Plant. The evaluation is to determine whether the proposed Technical Specifications are in conformance with the model Standard Technical Specification set forth by the NRC. A check list, Appendix A of this report, compares the licensee's submittal with the NRC requirements and includes Proposed Resolution of the Deviations.

49004 **(UCID—19714) Technical-evaluation report on the proposed technical-specification changes for the inservice surveillance of safety-related hydraulic and mechanical snubbers at the Haddam Neck Nuclear Power Plant (Docket No. 50-213).** Selan, J.C. (Lawrence Livermore National Lab., CA (USA)). 18 Aug 1983. Contract W-7405-ENG-48. 12p. NTIS, PC A02/MF A01. Order Number DE83016675.

This report documents the technical evaluation of the proposed Technical Specification changes to Limiting Conditions for Operation, Surveillance Requirements and Bases for safety-related hydraulic and mechanical snubbers at the Haddam Neck Nuclear Power Plant. The evaluation is to determine whether the proposed Technical Specifications are in conformance with the model Standard Technical Specification set forth by the NRC. A check list, Appendix A of this report, compares the licensee's submittal with the NRC requirements and includes Proposed Resolution of the Deviations.

49005 **(UCID—19715) Technical-evaluation report on the proposed technical-specification changes for the inservice surveillance of safety-related hydraulic and mechanical snubbers at the Indian Point Nuclear Power Plant, Unit 3 (Docket No. 50-286).** Selan, J.C. (Lawrence Livermore National Lab., CA (USA)). 18 Aug 1983. Contract W-7405-ENG-48. 13p. NTIS, PC A02/MF A01. Order Number DE83016613.

This report documents the technical evaluation of the proposed Technical Specification changes to Limiting Conditions for Operation, Surveillance Requirements and Bases for safety-related hydraulic and mechanical snubbers at the Indian Point Nuclear Power Plant, Unit 3. The evaluation is to determine whether the proposed Technical Specifications are in conformance with the model Standard Technical Specification set forth by the NRC. A check list, Appendix A of this report, compares the licensee's submittal with the NRC requirements and includes Proposed Resolution of the Deviations.

49006 **(UCID—19718) Technical-evaluation report on the proposed technical-specification changes for the inservice surveillance of safety-related hydraulic and mechanical snubbers at the Millstone Nuclear Power Station, Unit 2 (Docket No. 50-336).** Selan, J.C. (Lawrence Livermore National Lab., CA (USA)). 18 Aug 1983. Contract W-7405-ENG-48. 13p. NTIS, PC A02/MF A01. Order Number DE83016677.

This report documents the technical evaluation of the proposed Technical Specification changes to Limiting Conditions for Operation, Surveillance Requirements and Bases for safety-related hydraulic and mechanical snubbers at the Millstone Nuclear Power Station, Unit 2. The evaluation is to determine whether the proposed Technical Specifications are in conformance with the model Standard Technical Specification set forth by the NRC. A check list, Appendix A of this report, compares the licensee's submittal with the NRC requirements and includes Proposed Resolution of the Deviations.

49007 **Valve test program: response to TMI.** Lihach, N.; Bilanin, W.; Carey, J. *EPRI (Electric Power Research Institute) Journal;* **8**: No. 4, 14-17(May 1983).

The Electric Power Research Institute (EPRI) pressurized-water reactor (PWR) safety and relief valve test program was speedily organized to assess valve operability after a pressurizer relief valve malfunctioned at Three Mile Island (TMI). Comprehensive full-scale testing at several facilities validated the basic designs in use today. 2 figures.

49008 **Electricity. Report of the Secretary of State for Energy for the year ended 31 March 1982.** London, England; Secretary of State for Energy (1982). 11p. Dept. of Energy, Thames House South, Millbank, London SW1.

Brief references in the report to nuclear power generated by the CEGB cover the following items: application outstanding for a nuclear station of 3900 MW on the site of the existing stations at Dungeness, Kent; and application under consideration for a PWR nuclear generating station of 1200 MW on the site of the existing Sizewell station. The latter application will be the subject of a Public Enquiry: the main hearing will commence in January 1983. (U.K.).

49009 **Simple lake breeze front position technique for off-site dose assessment.** Burda, T.J.; Lyons, W.A.; Mazzola, C.A.; Van Helvoirt, G.T. (Stone & Webster Engineering Corporation, P.O. Box 2325, 245 Summer Street, Boston, MA 02107). *Transactions of the American Nuclear Society;* **43**: 83-84(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

49010 **Improved Penn State fuel management package incorporating the option to calculate correct Xenon-135 distribution for educational and research purposes.** Kim, S.S.; Levine, S.H. (The Pennsylvania State University, University Park, PA 16802). *Transactions of the American Nuclear Society;* **43**: 52-53(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

49011 **Pressurised water reactor in the United Kingdom.** London, England; Mechanical Engineering Publications Ltd. (1982). vp. (CONF-8205178—).

From Conference on pressurised water reactor in the United Kingdom; London, UK (11 May 1982).

Individual papers were processed for inclusion in the Energy Data Base.

2103 Power Reactors, Non-breeding, Graphite Moderated

REFER ALSO TO CITATION(S) 48975, 49017, 49191

49012 **(INIS-mf—7910) Reliability of thermocouples in the Windscale AGR.** Thurlbeck, A. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 8p. (CONF-8010325—17). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780766.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 3. Paper no. 4.

A brief description is given of two surveys carried out during 1977/78 on Windscale AGR thermocouples. One was concerned with fuel pin thermocouples, the other with channel gas inlet thermocouples. (author).

49013 **(INIS-mf—7912) Mineral insulated thermocouples - installation in steam generating plant.** Bridges, W.J.; Brown, J.F. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 23p. (CONF-8010325—19). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780768.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 3. Paper no. 6.

The main areas of interest considered are Central Station Fossil Fuel fired boilers of around 500 MW capacity, AGR Boilers, and Industrial and Research Development projects. While the requirement for temperature measurement in each of these areas may vary the techniques adopted to overcome installation and protection problems created by thermal, chemical and mechanical hazards remain basically the same. The reasons for temperature measurement are described together with methods of attachment development and procedures for protection of the thermocouple along its route length until its exit from the hazardous environment. These relative accuracies of the different attachments are discussed along with factors influencing the life of the thermocouple. In many instances thermocouple installation is either a once only opportunity and/or an expensive exercise. It is therefore essential to develop and apply an effective quality control system during the installation phase. An effective system is described. Finally, a brief outline of possible future trends is given. (author).

49014 **(JAERI-M—9942) Analysis of prompt neutron decay constants of critical and control rod inserted states of SHE-14. Accuracy investigation of VHTR nuclear design methods, (3).** Takano, M.; Doi, T.; Hirano, M.; Shindo, R. (Japan Atomic Energy Research Inst., Tokyo). Feb 1982. 64p. (In Japanese). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702423.

In the report, the prompt neutron decay constants, which were measured at Semi-Homogeneous Experimental Assembly (SHE)-14 of critical and control rod (s) inserted states, are analyzed for the purpose of verifying the computer codes and calculational methods employed in the nuclear design of VHTR. The codes, DELIGHT-5 and TWOTRAN-II calculate respectively neutron spectrum and prompt neutron decay constants with the various models of R-theta and X-Y geometries. Calculated values of prompt neutron decay constants show the disagreements of 4.38% for the critical state and about 2% for the control rod (s) inserted states from the measured values. Therefore, it can be said that the method and the codes employed to obtain the prompt neutron decay constants are adequate.

2104 Power Reactors, Non-breeding, Otherwise Moderated Or Unmoderated

REFER ALSO TO CITATION(S) 49169

49015 (INIS-mf—8131, pp vp) **Leak detection and location in light water reactors by means of acoustic methods.** Fischer, K.F. (Kraftwerk Union A.G., Erlangen (Germany, F.R.)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49016 (INIS-mf—8131, pp vp) **Influence of the vibration of PWR - core components to the local characteristics of reactor noise.** Dach, K. (Skoda, Plzen (Czechoslovakia)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

2105 Power Reactors, Breeding

REFER ALSO TO CITATION(S) 49075, 49135, 49794, 49848

49017 **(BLG—556) Annual report 1981.** (Centre d'Etude de l'Energie Nucleaire, Mol (Belgium)). [nd]. 212p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702354.

This report of the Centre d'Etude de l'Energie Nucleaire - Studiecentrum voor Kernenergie gives a survey of the scientific and technical work done in 1981. The research areas are: 1. The sodium cooled fast reactor and namely the mixed oxide fuels, the carbide fuel, the materials development, the reprocessing, the fast reactor physics, the safety and instrumentation and the sodium technology. 2. The gas cooled reactors as gas cooled fast and high temperature reactors. 3. The light water reactors, namely the BR3 reactor, the light water reactor fuels and the plutonium recycling. 4. The applied nuclear research, waste conditioning and disposal as the safeguards, the fusion research and the lithium technology. 5. The basis and exploratory research namely the materials science and the nuclear physics and finally 6. Non-nuclear research and development such as the air pollution, the pollution abatement and waste handling, the fuel cells and applied electrochemistry.

49018 **(CONF-830301—18) Effect of nonuniform inlet air flow on air-cooled heat-exchanger performance.** Soler, A.I.; Singh, K.P.; Ng, T.L. (Pennsylvania Univ., Philadelphia (USA). Dept. of Mechanical Engineering and Applied Mechanics; Oat (Joseph) Corp., Camden, NJ (USA)). 1983. Contract AT03-76SF76026. 7p. NTIS MF A01. Order Number DE83016363.

From ASME-JSME thermal engineering joint conference; Honolulu, HI, USA (20 Mar 1983).

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Blowers used to propel air across tube bundles generate a non-uniform flow field due to their construction details. A formalism to evaluate heat transfer degradation due to non-uniform airflow has been developed. Certain symmetry relations for cross flowheat exchangers, heretofore unavailable in the open literature, have been derived. The solution presented here was developed to model a 4 tube pass air blast heat exchanger for the Clinch River Breeder Reactor Plant Project. This case is utilized to show how this method can be used as a design tool to select the most suitable blower construction for a particular application. A numerical example is used to illustrate the salient points of the solution.

49019 (CONF-830905—5) CRBR pump water test experience. Cook, M.E.; Huber, K.A. (Borg-Warner Corp., Carson, CA (USA). Byron Jackson Pump Div.). 1983. Contract AT03-76SF72025. 11p. NTIS, PC A02/MF A01. Order Number DE83015537.

From Joint power generation conference; Indianapolis, IN, USA (25 Sep 1983).

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The hydraulic design features and water testing of the hydraulic scale model and prototype pump of the sodium pumps used in the primary and intermediate sodium loops of the Clinch River Breeder Reactor Plant (CRBRP) are described. The Hydraulic Scale Model tests are performed and the results of these tests are discussed. The Prototype Pump tests are performed and the results of these tests are discussed.

49020 (DOE/CL/50003—T3) Electromagnetic linear pump for liquid-metal service. Meisner, J. (Westinghouse Electric Corp., Madison, PA (USA)). [nd]. Contract AC15-76CL50003. 14p. NTIS, PC A02/MF A01. Order Number DE83016078.

Electromagnetic pumps are not noted for their efficiency - values on the order of 15% are not unusual. However, the Energy Systems Group of Rockwell International, under contract to the Department of Energy, has recently designed, built, and tested for the Clinch River Breeder Reactor Program (CRBRP) a pump that has a peak efficiency of 40%. This outstanding efficiency was obtained by optimizing the hydraulic and electrical properties of the pumping section early in the design phase. These performance features were proven in a highly successful series of tests at flow rates up to 800 gal/min and temperatures up to 1130°F. This article discusses the design in detail and presents some of the test results.

49021 (EPRI-NP—3167) Assessment, development, and application of LMFBR thermal-hydraulic analysis tools. Final report. Barthold, W.P.; Barthold, I.G. (Barthold and Associates, Inc., Albuquerque, NM (USA)). Jul 1983. 139p. NTIS, PC A07/MF A01. Order Number DE83902701.

Portions are illegible in microfiche products.

The whole-core LMFBR thermal-hydraulics codes COBRA-WC, COMMIX, CORE-3D, CORTRAN and SUPERENERGY-2 were evaluated from a design analyst's point of view. The issues considered in this evaluation were the basic algorithms, code capabilities, physical models, user instructions and general code features. The existing codes were classified as either benchmark-type codes (COMMIX, COBRA-WC) or approximate codes (CORE-3D, CORTRAN, SUPERENERGY-2). The CORTRAN code was recommended for whole-core design analysis because it is fast-running, easy to use and has a transient analysis capability. An expanded and improved version of CORTRAN, called CORTRAN-C was developed and applied to the analysis of split inlet plenum designs. Orificing strategies for split inlet plenum designs were investigated as well as the sensitivity of coolant outlet temperature to changes in the number of orificing zones. The transient capability of CORTRAN-C was demonstrated.

49022 (HEDL-SA—2728-FP) Mechanical properties of irradiated fast breeder reactor cladding and ducts. Johnson, G.D.; Hunter, C.W. (Westinghouse Hanford Co., Richland, WA (USA)). Feb 1983. Contract AC06-76FF02170. 11p. (CONF-830805—46). NTIS, PC A02/MF A01. Order Number DE83015472.

From 7. international conference on structural mechanics in reactor technology; Chicago, IL, USA (22 Aug 1983).

Austenitic stainless steels are being used for various core components in Liquid Metal Fast Breeder Reactors. Twenty percent cold worked Type 316 stainless steel is being used for both fuel pin cladding and ducts in the Fast Flux Test Facility. Safe and reliable operation of breeder reactors requires a characterization of the effects of fast neutron irradiation and environment on the mechanical properties of the cladding and duct material. Nearly 1400 tests have been conducted on unirradiated and irradiated cladding and duct samples under conditions relevant to reactor operational and transient events. Six different types of tests conducted on cladding and duct samples are described and the effects of irradiation on the properties are discussed.

49023 (INIS-mf—7905) Miniature inductive temperature sensor to monitor temperature noise in the coolant of an LMFBR. Dean, S.A.; Sandham, C.W. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 25p. (CONF-8010325—12). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780761.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 2. Paper no. 6.

A description is given of the design and performance of miniature inductive sensors developed to monitor fast temperature fluctuations in the sodium coolant above the core of a LMFBR. These instruments, designed to be installed within existing thermocouple containment thimbles, also provide a steady-state temperature indication for reactor control purposes. (author).

49024 (INIS-mf—8131, pp vp) Application of the recursive filtering to thermocouple time constant identification: Experimental results obtained on the Phenix LMFBR. Bernardin, B.; Le Guillou, G.; Parcy, J.P. (CEA Centre d'Etudes Nucleaires de Cadarache, 13 - Saint-Paul-les-Durance (France)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49025 Thermal performance modeling of sphere-pac mixed carbide fast reactor fuel. Ades, M.J.; Montgomery, S.D.; Peddicord, K.L. (Exxon Nuclear Company, Inc., 2101 Horn Rapids Road, Richland, Washington 99352). *Nuclear Science and Engineering;* **84**: No. 1, 47-57(May 1983).

A promising fuel concept for fast breeder reactor applications is sphere-pac mixed carbide fuel. To support this development, it is necessary to devise analytical methods to assess and predict the behavior of fuel pins under irradiation conditions. This Note describes the modeling of the thermal aspect of this behavior. As a first step in treating a sphere-pac mixed carbide fuel pin, models for various physical phenomena have been developed and integrated to give the overall fuel pin response. Included are descriptions for the thermal conductivity of the packed particle bed in its initial configuration and during restructuring, the sintering of fuel spheres leading to the restructuring within the pin, the temperature distribution, grain growth and porosity redistribution, gas release and free swelling, and the effect of the gas in the free volume of the pin. The models describing the various thermal components were incorporated into the computer program SPECKLE-I. In the absence of a detailed mechanism analysis, restrictive assumptions were made. While the code is a limited first step in the analysis, results from SPECKLE-I were compared with several pin irradiations. Calculations of gas pressure and composition, fractional gas release, and the extent of initial-stage restructuring within the pin were compared to measurements. Initial results generally agree to within 20% or better for the parameters investigated.

49026 (KFK-tr—676) Experimental investigations of local flow parameters near the walls of fuel elements of fast breeder reactors. Part 2. Measuring results with nominal geometry without displacement bodies. Hejna, J.; Vosahlo, L.; Cervenka, J.; Schmid, J. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Stabsabteilung Internationale Beziehungen). 1981. Translation source information not available . 56p. (In German). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83780869.

The presented material is the result of the first stage of experiments performed on the NEM-2 model, with the initial comparative values for evaluation of the effects of the geometry dimensions in the cluster upon the fluid-dynamic conditions being concerned in the main. The investigation of those effects (presence of displacement bodies, displacement of single rods or rod groups etc.) will be subject of further experimental works.

2106 Power Reactors, Auxiliary, Mobile, Package, And Transportable

REFER ALSO TO CITATION(S) 49320

2107 Regulation And Licensing

REFER ALSO TO CITATION(S) 49188, 49189

49027 (INIS-BR—05, pp vp) **Nuclear Power Plant (NPP) safety in Brazil.** Lederman, L. (Comissao Nacional de Energia Nuclear de Brasil, Rio de Janeiro:. Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

The multidisciplinary aspects of the activities involved in the nuclear power plant (NPP) licensing, are presented. The activities of CNEN's technical staff in the licensing of Angra-1 and Angra-2 power plants are shown.

49028 (INIS-BR—05, pp vp) **FURNAS experience on licensing of Nuclear power plant Angra-I.** Volpi, C.A.; Silva, A.J.C. da; Cunha, M.L. da (FURNAS, Rio de Janeiro (Brazil)). Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

A brief description is given of Furnas-Centrais Eletricas S/A related to the licensing procedure of the Angra Nuclear Power Plant Unit 1, Angra-1. An overview of Furnas licensing staff structure and the most relevant problems which have ocurred during Angra-1 licensing process, is also given.

49029 (INIS-BR—05, pp vp) **Principles of nuclear safety in the Federal Republic of Germany.** Pfaffelhuler, J.K. (Bundesministerium des Innern, Bonn (Germany, F.R.)). Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

A survey of the nuclear installations in the Federal Republic of Germany is presented. Also, the necessary preparations for a country, which wants to introduce nuclear power and the legal basis, the technical principles and the licensing procedure as practised in the Federal Republic of Germany are discussed.

49030 (INIS-BR—05, pp vp) **Fundamentals of law and of technical regulations and the problem of jurisdiction.** Lukes, R. (Muenster Univ. (Germany, F.R.)). Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

The fundamentals of the legal requirements and technical specifications for the licensing of Nuclear Power Plants in the Federal Republic of Germany and the German administrative jurisdiction in this area are discussed.

49031 (INIS-BR—05, pp vp) **Legal bases for the installation of nuclear power plants.** Faria, N.M. de (Comissao Nacional de Energia Nuclear de Brasil, Rio de Janeiro:; Lima Moreira, Y.M. de (FURNAS, Rio de Janeiro (Brazil)); Barros, E.A. (Departamento Nacional de Aguas e Energia Eletrica). Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

The role of the National Nuclear Energy Comission, the National Department of Water and Electrical Energy and the 'Centrais Eletricas Brasileiras S.A.' for the installation of Nuclear Power Plants is presented.

49032 (INIS-BR—05, pp vp) **Safety criteria, guidelines and standards.** Fechner, J.B. (Bundesministerium des Innern, Bonn (Germany, F.R.)). Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

The criteria, guidelines and standards for licensing of construction and operation of nuclear power plants in the Federal Republic of Germany are described.

49033 (INIS-mf—7928) **IAEA codes and guides for safety of nuclear power plants.** Raisic, N. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 36p. (CONF-8010323—38). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780775.

From IAEA interregional training course on quality assurance; Karlsruhe, F.R. Germany (27 Oct 1980).

The objectives and scope of the Agency's programme of nuclear safety standards are described and the role of these documents in regulation of nuclear power im Member States is discussed. For each of the five areas of safety standards development, i.e. siting, design, operation, quality assurance and governmental organization, a set of principles underlying requirements and recommendations contained in the Code of Practice and Safety Guides will be presented. Safety Guides in each of the five areas will be reviewed in respect of the scope and content. A consideration will be given to the future development of the safety standards and to the revision and updating of the published documents. (orig./RW).

49034 (INIS-mf—7930) **Licensing procedure, nuclear codes and standards in the Federal Republic of Germany.** Schultheiss, G.F. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 58p. (CONF-8010323—39). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83780776.

From IAEA interregional training course on quality assurance; Karlsruhe, F.R. Germany (27 Oct 1980).

The present paper deals with legal background of licensing in nuclear technology and atomic energy use, licensing procedures for nuclear power plants and with codes, standards and guidelines in the Federal Republic of Germany. (orig./RW).

49035 (INIS-mf—7975) **Layout of the safety analysis report for nuclear power plants with pressurized water reactor or boiling water reactor in the Federal Republic of Germany.** Albrecht, E. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 27p. (CONF-8009308—18). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780777.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

For a licence according to paragraph 7 of the Atomic Energy Act to construct and operate a nuclear power plant, the applicant has to submit a safety analysis report, which must describe the site, the plant, all hazards in connection with the plant and the proposed safety precautions. For the structure and the content of a safety analysis report, a first guideline was published in 1959. Only a few safety analysis reports were prepared nearly strictly according to this guideline. In 1976 a second guideline was published for a standard safety analysis report. The lecture deals with the guidelines. A survey over the structure and content of the German safety analysis reports will be given. The experience gained by the new safety analysis reports will be discussed. (orig.).

49036 (INIS-mf—7978) **General aspects of siting and safety considerations.** Rutgers, E. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 37p. (CONF-8009308—19). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780778.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

The siting process from site selection to the different stages of review by the regulatory body is described. Special attention is payed to the role and responsibilities of the licensing authority. Next, the basic considerations involved in the siting process are reviewed. They include system planning, engineering, safety, environ-

mental impact (including land use) and economics. Case studies illustrating different aspects of the siting process (e.g. site selection) are presented. (orig.).

49037 **(INIS-mf—8016) Economic aspects of quality assurance.** Mugica, A.P. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 11p. (CONF-8010323—40). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780779.

From IAEA interregional training course on quality assurance; Karlsruhe, F.R. Germany (27 Oct 1980).

The present paper deals with definition, purpose and structure of quality assurance costs. Finally the costs of QA in the Spanish public utilities are discussed. (RW).

49038 **(INIS-mf—8027) Instruction of 27 March 1973 concerning implementation of Decree No 73-278 of 13 March 1973 setting up a Higher Council for Nuclear Safety and a Central Service for the Safety of Nuclear Installations.** 27 Mar 1973. 10p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780794.

This Instruction specifies, on the basis of the 1973 Decree, the duties, in particular regarding licensing, of the Central Service for the Safety of Nuclear Installations. The Service is assisted in its work by the Atomic Energy Commission (CEA) and advisory groups.(NEA).

49039 **(INIS-mf—8037) Order of 9 October 1975 setting up an Institute for Fundamental Reasearch in the Atomic Energy Commission.** 17 Oct 1975. 1p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780795.

Published in the French Official Gazette.

This Order, which sets up an Institute for Fundamental Research, also defines its duties and membership. (NEA).

49040 **(INIS-mf—8044) Order of 29 june 1982 concerning the apportionment of contributions from the operators of large nuclear installations.** 8 Aug 1982. 1p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780783.

Published in the French Official Gazette.

This Order determines the arrangements for allocating the contributions of operators of large nuclear installations to the budget of the Ministry of Industry. (NEA).

49041 **(INIS-mf—8045) Order of 24 August 1982 repealing the provisions of a previous Order setting up a Financial Committee within the Atomic Energy Commission.** 26 Aug 1982. 1p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780797.

Published in the French Official Gazette.

The order setting up a Financial Committee within the CEA is repealed as a consequence of the establishment of an Administrative Board for the Commission. (NEA).

49042 **(NUREG—0871-Vol.2-No.3) Summary Information report. Vol. 2, No. 3.** (Nuclear Regulatory Commission, Washington, DC (USA). Office of Resource Management). Aug 1983. 51p. NTIS, PC A04/MF A01 - GPO. Order Number DE83902761.

Portions are illegible in microfiche products.

The Summary Information Report (SIR) provides summary data concerning NRC and its licensees for general use by the Chairman, other Commissioners and Commission staff offices, the Executive Director for Operations, and the Office Directors. SIR is published quarterly by the Management Information Branch (49-27834) of the Office of Resource Management.

49043 **(NUREG/CR—0130-Add.2) Technology, safety, and costs of decommissioning a reference pressurized-water-reactor power station: effects on decommissioning of interim inability to dispose of wastes offsite.** Holter, G.M.; Murphy, E.S. (Pacific Northwest Lab., Richland, WA (USA)). Jul 1983. Contract AC06-76RL01830. 41p. NTIS (US Sales Only), PC A03/MF A01 - GPO $3.75. Order Number DE83016660.

In the analysis of the decommissioning of a reference pressurized water reactor (PWR) reported previously in NUREG/CR-0130, it was assumed that radioactive wastes from decommissioning, including spent fuel, could be disposed of offsite at the time of decommissioning. The purpose of this addendum is to examine the impacts on the technology, safety and costs of decommissioning the reference PWR that would result from an inability to dispose of wastes offsite at the time of decommissioning. Three onsite waste storage alternatives are evaluated: (1) interim onsite storage of low-level waste (LLW), (2) interim onsite storage of spent fuel, and (3) interim onsite storage of both LLW and spent fuel. The maximum period for onsite storage of these wastes is postulated to be about 100 years. At the conclusion of this arbitrary storage period, the wastes are assumed to be shipped offsite and the decommissioning completed to permit unrestricted release of the facility.

2108 Economics

REFER ALSO TO CITATION(S) 49010

49044 **(CONF-8206210—1) Overview of the nuclear fuel cycle.** Leuze, R.E. (Oak Ridge National Lab., TN (USA)). 1982. Contract W-7405-ENG-26. 60p. NTIS, PC A04/MF A01. Order Number DE83015511.

From Applied health physics course; Oak Ridge, TN, USA (15 Jun 1982).

Portions are illegible in microfiche products.

The use of nuclear reactors to provide electrical energy has shown considerable growth since the first nuclear plant started commercial operation in the mid 1950s. Although the main purpose of this paper is to review the fuel cycle capabilities in the United States, the introduction is a brief review of the types of nuclear reactors in use and the world-wide nuclear capacity.

49045 **(ELETROBRAS-DENE-TN—26) Nuclear fuel. Availability, demand and cost.** de Azevedo, J.B.L. (ELETROBRAS, Rio de Janeiro (Brazil). Dept. de Estudos Energeticos). 1980. 82p. (In Portuguese). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702347.

All stages of nuclear fuel cycle are analysed with respect to the present situation and future perspectives of supply and demand of services; the prices and the unitary cost estimation of these stages for the international fuel market are also mentioned. From the world resources and projections of uranium consumption, medium-and long term analyses are made of fuel availability for several strategies of use of different reactor types. Finally, the cost of nuclear fuel in the generation of electric energy is calculated to be used in the energetic planning of the electric sector.

49046 **(INIS-mf—7984) Use of plutonium in Swedish reactors.** Forsstroem, H. (Svensk Kaernbraenslefoersoerjning AB, Stockholm). Sep 1982. 62p. (In Swedish). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83780741.

The report deals with the utilization of plutonium in Swedish nuclear power plants. The plutonium content of the mixed oxide fuel will normally be 3-7 per cent. The processing of spent nuclear fuel will produce about 6 ton plutonium. The use of mixed oxide fuel in Forsmark 3 and Oskarshamn 3 is discussed. The fuel cycle will start with the manufacturing of the fuel elements abroad and proceeds with transport and utilization, storing of spent fuel about 40 years in Sweden followed by direct disposal. The manufacture and use of mixed oxide (MOX) fuel is based on well known techniques. Approximately 20000 MOX fuel rods have been irradiated and the fuel is essentially equivalent to uranium oxide fuel. 30-50 per cent of the core may be composed of MOX-fuel without any effect on the operation and safety of the reactor which has been originally designed for uranium fuel. The evaluation of international fuel cycle (INFCE) states that the proliferation risks are very small. The recycling of plutonium will reduce demand for enriched uranium and the calculations show that 6.3 ton plutonium will replace the enrichment of 600 ton natural uranium. (G.B.).

49047 **Effects of nuclear power plants on residential property values.** Gamble, H.B.; Downing, R.H. (Pennsylvania State Univ., University Park). *Journal of Regional Science;* 22: No. 4, 457-478(Nov 1982).

The results are presented of two studies done on the effects of nuclear power plants on residential property values. One study, which examined property values in the vicinity of four Northeastern power plants prior to the March, 1979 TMI accident, found no significant evidence positively or negatively. Using the same analytic approach, residences in the TMI area were surveyed after the accident and again no determining evidence was found upon consideration of all of 1979. The methodology of both studies is examined along with a discussion of the hedonic price model on which they were based. It is speculated, however, that the difficulties involved in the clean up and the resultant rise in utility prices may inadvertently create long-term capitalization effects. 18 references.

49048 **Comparison of various measures and options for nuclear fuel supply assurance.** Braun, C. (Electric Power Research Institute, 3412 Hillview Avenue, P.O. Box 10412, Palo Alto, CA 94303). *Transactions of the American Nuclear Society;* 43: 135-136(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

22 NUCLEAR REACTOR TECHNOLOGY

2201 Theory And Calculation

REFER ALSO TO CITATION(S) 50310

49049 **(CUED/A-NUCL-TR—1) Mathematics of nuclear engineering.** Lewins, J.D. (Cambridge Univ. (UK). Dept. of Engineering). 1982. 62p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702350.

The mathematics of nuclear engineering is considered with especial reference to the problems of the representation of the transformation of matter at the nuclear level by radioactive decay and neutron transmutation, the problem of the distribution of neutrons and other particles as a transport theory problem including some of the approximation methods used in this problem, particularly diffusion theory with particular emphasis on steady-state problems, time-dependent reactor kinetic and control, and the longer term changes involved with the nuclear fuel cycle both within and without the reactor itself.

49050 **(IA—1368) Three dimensional diffusion calculations of nuclear reactors.** Caspo, N. (Ben-Gurion Univ. of the Negev, Beersheba (Israel). Dept. of Nuclear Engineering). Jul 1981. 120p. (In Hebrew). NTIS (US Sales Only), PC A06/MF A01. Order Number DE83702329.

Thesis.

This work deals with the three dimensional calculation of nuclear reactors using the code TRITON. The purposes of the work were to perform three-dimensional computations of the core of the Soreq nuclear reactor and of the power reactor ZION and to validate the TRITON code. Possible applications of the TRITON code in Soreq reactor calculations and in power reactor research are suggested.

49051 (IA—1375, pp 31-32) **Validation of the three-dimensional code TRITON by comparison with experimental results.** Caspo, N.; Yiftah, S. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49052 **(INIS-mf—7913) Summary of activities July 1981 - July 1982.** (Stichting Energieonderzoek Centrum Nederland, The Hague). Jul 1982. 8p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702352.

Background information, which may be useful for an understanding of ECN activities has been reported. The period starting 1 July 1981 and ending 30 June 1982 covers summaries of fission power, fusion and superconductivity; energy from fossil fuels; wind energy; utilization of the Petten research reactors. The financial figures are taken from the ECN Annual report (in Dutch) and refer to the calender year 1981.

49053 **(INIS-mf—7923) Information on the Karlsruhe Nuclear Research Center.** Reuter, H.H. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 14p. (CONF-8010323—37). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780746.

From IAEA interregional training course on quality assurance; Karlsruhe, F.R. Germany (27 Oct 1980).

A short overview is given about the origins of Karlsruhe Nuclear Research Center. The historical development of the different companies operating the Center is shown. Because the original task assigned to the Center was the construction and testing of the first German reactor exclusively built by German companies, a detailed description of this reactor and the changes made afterwards is presented. Next, today's organizational structure of the Center is outlined and the development of the Center's financing since its foundation is shown. A short overview about the structure of employees from the Center's beginning up to now is also included as well as a short description of today's main activities. (orig.).

49054 (INIS-mf—8131, pp vp) **Local component versus slowing down/several group theories.** Pazsit, I. (Hungarian Academy of Sciences, Budapest. Central Research Inst. for Physics). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49055 (INIS-mf—8131, pp vp) **Three group three dimension analysis of the random neutron fluid in bare homogeneous reactors and the concepts of local and global neutron noise.** Analytis, G. (Eidgenoessisches Inst. fuer Reaktorforschung, Wuerenlingen (Switzerland)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49056 **The effects of intracell adjoint flux heterogeneity on first-order perturbation reactivity calculations.** Smith, K.S. (Argonne National Laboratory, P.O. Box 2528 Idaho Falls, Idaho 83401). *Nuclear Science and Engineering;* 81: No. 3, 451-458(Jul 1982).

Conventional cell homogenization methods that use real flux weighting of cross sections introduce errors into FOP reactivity calculations because of the inappropriate use of homogenized cross sections to compute adjoint fluxes. Homogenized FOP reactivity calculations can be corrected for adjoint flux deficiencies. Such corrections, which depend on the degree of heterogeneity of the critical assembly and the nature of the experiment being modeled, can be as large as 10%. By performing the appropriate corrections to conventional FOP reactivity calculations, a significant fraction of the long-standing central worth discrepancy is eliminated.

2202 Components And Accessories

REFER ALSO TO CITATION(S) 49481

49057 **(INIS-mf—7906) Insulation degradation in long, mineral insulated metal sheathed thermocouples.** Burnett, P. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 12p. (CONF-8010325—13). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780762.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 2. Paper no. 7.

As the lead temperature of a mineral insulated thermocouple is raised, the resistance of the insulator decreases and acts as a resistive shunt on any thermoelectric emf which is generated, thereby

leading to errors in temperature measurement. Furnace tests are described in which such errors are demonstrated and a computer code has been used to predict the magnitudes of the errors. A method of predicting the performance of a thermocouple under high lead temperature conditions is proposed, which could be used as a selection process by a thermocouple manufacturer. The work has applications in the field of nuclear reactor in-core temperature instrumentation, in high temperature test rigs and in fire test facilities, where long thermocouple leads pass through high temperature environments. (author).

49058 **(INIS-mf—7956) Excore neutron flux measurements.** Jacobi, S.110Excore neutron flux measurements. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 19p. (CONF-821039—29). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780748.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

The present paper deals with the measurement of neutron flux using detectors arranged outside the reactor core. Requirements to the system and different neutron counters are discussed. (RW).

49059 **(INIS-mf—7957) Incore neutron flux measurements.** Jacobi, S.110Incore neutron flux measurements. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 18p. (CONF-821039—30). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780749.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

The present paper deals with methods of flux measurement inside reactor cores and discusses the arrangement of the detectors within the reactor lattice. (RW).

49060 **(INIS-mf—7974) Reactor protection and shutdown system.** Klar. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 20p. (CONF-8009308—14). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780726.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

The reactor protection system being a part of the reactor safety system. The requirements on the reactor protection system are: high safety with regard to signal processing, high availability, self-reporting of faults etc. The functional sections of the reactor protection system are the analog section, the logic section and the generating of output signals. Description of the operation characteristics and of the extension of function. (orig.).

49061 **(INIS-mf—7986) Quality assurance and quality control in fabrication of heat exchanger tubes.** Duennewald, A. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 8p. (CONF-8010323—25). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780707.

From IAEA interregional training course on quality assurance; Karlsruhe, F.R. Germany (27 Oct 1980).

Object of this report is the manufacture of heat exchanger tubes. A comprehensive manufacturing and test program has to be established to assure and prove and equal tube quality. This requires a functionally operating quality assurance system combined with a production exactly planned in advance. A specific continuous production line for heat exchanger tubes has been erected at the Hellenthal plant of the Mannesmannroehren-Werke. All production steps and heat treatments are generally controlled by a quality control department. Non-destructive testing of each tube produced in standard length is performed on several agregates in line using ultrasonic and/or eddy current technique. All tests are generally performed in the presence of quality inspectors or surveyors. For a lot of heat exchangers the straight tubes have to be hairpin bended. To avoid the risk of stress corrosion cracking, it is recommended to procreate defined compression stresses in the outside tube surface. Prior to releasing the tubes to shipment, the completeness of the documentation as to the manufacturing steps and inspection agreed upon is thoroughly checked. (RW).

49062 **(INIS-mf—8002) Quality assurance during preoperational testing and during startup operation.** Eisele, H.; Meyer, F.A. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 15p. (CONF-8010323—28). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780727.

From IAEA interregional training course on quality assurance; Karlsruhe, F.R. Germany (27 Oct 1980).

Rules and guidelines for the quality assurance. Quality assurance in the course of preoperational testing and the startup period: preoperational testing; hot functional test I; hot functional test II; initial making critical and zero power physics testing; power range testing. Startup documents: startup program; startup instructions; startup data sheet; startup sequence outlines; final startup reports. Advisory safety committee for nuclear startup. (orig./RW).

49063 **(INIS-mf—8003) Quality assurance in preoperational testing and startup.** Eisele, H. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 37p. (CONF-8010323—29). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780728.

From IAEA interregional training course on quality assurance; Karlsruhe, F.R. Germany (27 Oct 1980).

The present paper deals with rules and guidelines for quality assurance; quality assurance in pre-operational tests and during start-up period and with standards for logging. (RW).

49064 **(INIS-mf—8007) Quality assurance during site construction VII (control and instrumentation).** Hager, H.D.110Quality assurance during site construction VII (control and instrumentation). (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 17p. (CONF-8010323—27). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780709.

From IAEA interregional training course on quality assurance; Karlsruhe, F.R. Germany (27 Oct 1980).

For components to be used in reactor protection systems or safety systems of nuclear power plants a high quality is required. In order to assure this, Kraftwerk Union has designed a QA-program. This program includes following steps: manufacturer audit, components audit, type tests, suitability test, qualification by usage, LOCA-test, seismic test, shop-testing. (orig./RW).

49065 **(INIS-mf—8105) Quality assurance during site construction.** Dommke, J.; Jurgutat, H. (Technischer Ueberwachungs-Verein Baden e.V., Mannheim (Germany, F.R.)). (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 15p. (CONF-8009308—36). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702798.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

During the time of planing and construction of a nuclear power plant, the following proceeding is approved: - the deliverer of a nuclear power plant provides the reports fixing the quality assurance program, it means that he is responsible to write the safety analysis report, the specifications for the erection of the components, the working manuals and specifications for testing (eg nondestr. testing) - the manufacturing of components or systems will be controlled by an own independent quality assurance group, provided that this group was checked by the quality assurance group of the applicant - the TUeV with its independent assessors will fix the requirements relating to quality assurance in its assessment. On this basis the examination of the applicants specifications, working manuals, testing specifications will be done. The efficiency of quality assurance at the manufacturer and at the applicant will be checked by the TUeV specialists by considering specifications of modifications, repairs or tolerances. A mean point of the quality assurance in Germany is the dynamic adjustment, of an action on the latest state of engineering or science. If there exists a change of rules or guidelines, the quality assurance requirements have to be fit

on this state in so far as it is feasible from the technical point of view.

49066 **(INIS-mf—8114) Ventilation systems.** Gossler (Kraftwerk Union A.G., Erlangen (Germany, F.R.)). (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 6p. (CONF-8009308—37). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702799.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

The present paper deals with - controlled area ventilation systems - ventilation systems for switchgear-building and control-room - other ventilation systems for safety equipments - service systems for ventilation systems.

49067 **(INIS-mf—8119) Auxiliary systems.** Wurzer, K. (Kraftwerk Union A.G., Erlangen (Germany, F.R.)). (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 34p. (CONF-8009308—39). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702801.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

For a undisturbed reactor operation, the various Auxiliary and Ancillary Systems must function perfectly with the Reactor Coolant System together. While the Auxiliary Systems are directly connected to the Reactor Coolant System and therefore have contact with the Reactor Coolant, the Ancillary Systems perform tasks which do not directly influence reactor operation and in part are necessary exclusively for environment protection. The design criteria of the individual systems are a result of these tasks, especially in relation to availability, operational readiness and probability of failure.

49068 **(INIS-mf—8123) Control room design.** Zinke, H. (Brown, Boveri und Cie A.G., Mannheim (Germany, F.R.)). (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 8p. (CONF-8009308—41). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702803.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

To control a 1300 megawatt nuclear power plant, about 15000 plant parameters must be collected together to control and operate the plant. The control room design therefore is of particular importance. The main design criteria are: Required functions of the power plant process - Level of Automation - Ergonomics - Available Technology. Extensive analysis has resulted in a control room design method. This ensures that an objective solution will be reached. Resulting from this methodical approach are: 1. Scope, position and appearance of the instrumentation. 2. Scope, position and appearance of the operator controls. Process analysis dictates what instrumentation and operator controls are needed. The priority and importance of the control and instrumentation (this we define as the utilisation areas), dictates the rough layout of the control room.

49069 **(INIS-mf—8124) Containment design.** Schulz, H. (Gesellschaft fuer Reaktorsicherheit m.b.H. (GRS), Koeln (Germany, F.R.)). (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 24p. (CONF-8009308—42). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702804.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

The mechanical design and engineering principles of different reactor type containments are presented. The related criteria, codes and guide-lines necessary for the evaluation of the containment are mentioned and discussed in detail as demanded. The technical requirements for PWR-containments regarding - mechanical design - stress analysis - materials - fabrication - inspection form the main part of the lecture. Special aspects like qualification of penetrations are discussed briefly. The thermodynamic loads arising from accident conditions are taken as given conditions.

49070 **(INIS-mf—8126) Design of large components.** Schulz, H. (Gesellschaft fuer Reaktorsicherheit m.b.H. (GRS), Koeln (Germany, F.R.)). (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 19p. (CONF-8009308—44). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702806.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

The purpose of the lecture is to show the technical requirements in general and in detail for the design of large components with respect to the evaluation of loads and their time dependency design - material - protection against different failure mode - manufacturing and testing - commissioning - operation control and recurring inspection. It is the intention to achieve a good understanding of the basic safety approach. Focal areas in the safety review are pointed out.

49071 **(IS-M—417) Simplified methods for the inelastic analysis of stiffened shells.** Fanous, F.S.; Greimann, L.F. (Ames Lab., IA (USA)). 1983. Contract W-7405-ENG-82. 9p. (CONF-830805—47). NTIS, PC A02/MF A01. Order Number DE83016518.

From 7. international conference on structural mechanics in reactor technology; Chicago, IL, USA (22 Aug 1983).

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Despite the extreme precautions that are usually considered in the design and construction of nuclear power plant containment vessels, there is a non-zero probability of radioactivity leakage from the containment. In view of this, there is a need to define the structural capability to withstand various types of loading. This paper represents a portion of a project sponsored by the USNRC, the objective of which is to assess the uncertainty of the containment resistance. The work presented herein is devoted to predicting the vessel resistance under uniform internal static pressure. In this study strains, more particularly, the maximum circumferential membrane strain is selected as basis of failure indication. A value of two is used as a lower limit of the strain ductility capacity. Twelve axisymmetric models are analyzed using the finite element technique and the results compared to the simplified methods. Additionally, an actual containment vessel is presented to illustrate the applicability of the methods. The results are found to be sufficiently accurate to define the resistance of the containment vessel.

49072 **(NUREG/CR—3182) Development of an in-situ method for testing neutron sensors used in nuclear-power-plant reactor-protection systems. Final report, September 1981-September 1982.** Behbahani, A.; Miller, D.W.; Talnagi, J.W. Jr. (Ohio State Univ. Research Foundation, Columbus (USA)). Jul 1983. 441p. NTIS, PC A19/MF A01 - GPO $9.00. Order Number DE83902787.

This report describes a method for testing neutron sensor response time to meet the provisions of ISA S67.06, IEEE Std 338-1977, and NRC Regulatory Guide 1.118. The method requires the perturbation of the high voltage from the power supply to the neutron sensor and measurement of the signal response from the sensor. The method can potentially be applied on-line, does not require reactor shutdown or other interference with plant operation, does not require installation of special sensors, and only minor sensor modification. The high voltage perturbation method uses a mercury-wetted contact relay switch (designed and constructed in this study) to turn on the high voltage bias to the sensor in less than 10 nanoseconds. This provides an effective step and facilitates measurement of the sensor step response. Evaluation of the technique was made through simulated detector and cable degradation. The boron lined chamber response was investigated for two different fill gases: nitrogen (i.e., normal fill gas) and xenon. The fission ion chamber response was investigated for a sensor in a normal state and one with known failure of the seal between the chamber and signal cable.

49073 (PNL-SA—11153) Biofouling of power-plant service systems by Corbicula. Page, T.L.; Neitzel, D.A.; Simmons, M.A.; Hayes, P.F. (Pacific Northwest Lab., Richland, WA (USA)). Aug 1983. Contract AC06-76RL01830. 20p. (CONF-830649—2). NTIS, PC A02/MF A01. Order Number DE83016086.

From 2. international corbicula symposium; Hot Springs, AR, USA (21 Jun 1983).

Corbicula sp. foul the service water systems at nuclear power plants because the environment within these systems is compatible with the ecological requirements of the species. To reduce Corbicula fouling, components of service water systems and operating procedures that enhance the potential for fouling need to be identified. Factors important in mediating biofouling of service water systems appear to be screening potential, minimum and maximum velocities and the operational procedures employed during power plant biofoulant control and downtime. These conclusions are based on the results of a categorical model we used to correlate information from power plants with that on Corbicula life history. Power plant parameters in the model include temperature, dissolved oxygen concentration, screen and strainer size, maximum and minimum velocities, and elements of the biofouling control procedures. Parameters for Corbicula include tolerances to temperature, dissolved oxygen, biofouling control chemicals, velocity preferences, and optimal temperatures for each life stage and behavior. 13 references, 5 figures.

49074 (SKI-B—46-81(Pt.1)) In-flow technology for the determination of Sr-90 concentrations in nuclear power plants. Swedish Nuclear Power Inspectorate - Project B 46/81, Part 1. Dissing, E. (Studsvik Energiteknik AB, Nykoeping (Sweden)). 19 May 1982. 75p. (STUDSVIK-NR—82-125). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702336.

Outlines for a future work concerning in-flow surveillance of Sr-90 in nuclear plant process streams have been studied. The many problems involved with the task of on-line Sr-90 determination were approached in two different ways, one applying β-counting of the 64-hour daughter Y-60 with the use of the process stream itself as a Cerenkov scintillator and the other - indirect - using simultaneous measurement of the concentrations of Sr-91 and Sr-92 for the determination of the leakage route for strontium.

2203 Fuel Elements

49075 (INIS-mf—7911) Application of MI cable to measure temperatures in a sodium heat transfer experiment. Davies, N.W.; Barrett, W.I.; Sheward, G.E.; Cameron, P. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 27p. (CONF-8010325—18). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780767.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 3. Paper no. 5.

A description is given of the design and manufacture of a complex instrumented heater plate assembly to investigate natural convection in a liquid sodium environment up to 400°C. The theory of the experiment and results obtained are discussed. The manufacture of the assembly required the application of a novel design to ensure the accurate positioning of the thermocouples and incorporation of heater cables into a flat plate. The various joining methods used in manufacture, both welding and brazing, are described and the quality procedures used to underwrite the integrity of the assembly for use in liquid sodium are discussed. The life of this assembly has far exceeded original expectations and underwrites the application of brazing in this demanding situation. (author).

49076 (INIS-mf—7988) Quality assurance and quality control in fabrication of cladding tubes. Kessel, H. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 10p. (CONF-8010323—26). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780708.

From IAEA interregional training course on quality assurance; Karlsruhe, F.R. Germany (27 Oct 1980).

Zircaloy 2 and 4 are the most important Zirconium alloys for use as fuel cladding material in light and heavy water reactors. In fast breeder reactors the cladding tubes are of a modified 16/16 - Cr-Ni-type with improved mechanical, long - term creep rate and rupture - life versus temperature properties. Starting with hot-extruded tube shells the fabrication of Zircaloy cladding tubes is done by 3 - 4 cold reduction steps in tube reducers or rolling machines followed by heat treatments in vacuum. To obtain the specified properties a precise combination of final area reduction and final annealing is absolutely necessary. The fabrication route of stainless steel claddings and guide tubes is similar to the Zircaloy production, exceptionally the last cold-forming steps are made on cold-drawing henches, hecause of economic reasons. After each cold reduction the material is annealed at recrystalisation temperatures under protective atmosoheres. For obtaining the same final tube properties for a longer nroduction neriod the implementation of a quality assurance and control system naturally independent of the production is necessary. The application of this system regarding some of the important properties of fuel cladding tubes is reported. (RW).

49077 (INIS-mf—8122) Core and fuel element design. Rothmann, H. (Brown Boveri Reaktor G.m.b.H., Mannheim (Germany, F.R.)). (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 35p. (CONF-8009308—40). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702802.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

The lecture will be divided into four parts: Nuclear-Thermohydraulic-Mechanical Design and Core Control and Protection. After a short introduction of each chapter, the basic design criteria, the methods, and the results will be discussed. In the core control and protection chapter special emphasis will be placed on the German licensing situation. A short introduction to major development presently underway will also be given.

49078 (JAERI-M—82-042) Determination of volatile impurity gases in uranium carbide pellets. Handa, M.; Watanabe, H.; Takahashi, I. (Japan Atomic Energy Research Inst., Tokyo). May 1982. 18p. (In Japanese). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702420.

The outgassing of uranium carbide pellets following storage in various atmosphere has been investigated as a preliminary test for mixed uranium-plutonium carbide and for examining the glove box atmosphere necessary for carbide fuel pin preparation line. A universal high-temperature heat treatment furnace was used throughout the experiments. A gas line filter with new exchange mechanics was installed in the impurity gas exhausting line. The blank value of the filter was kept in a very low level by preheating the filter element for degassing. The efficiency of the filter was not deteriorated by repetition of the degassing. Amounts of impurity gases from the uranium carbide pellets were far smaller than those expected from their chemical instability, i.e., less than 20 μl/g and 10 μl/g were evolved from the pellets stored in air for 168 hrs and in argon ($<$50 ppm H_2O, $<$10 ppm O_2) for 3 hrs, respectively. The main products of the impurity gases were hydrogen (75 - 80%), carbon monoxide (12 - 20%) and methane (max. 5.5%). From the results obtained, it is considered that the atmosphere of the glove box for the fuel pin preparation line is sufficient with once-through of argon gas.

49079 (JAERI-M—9683) FREC-4A: a computer program to predict fuel rod performance under normal reactor operation. Harayama, Yasuo; Izumi, Fumio. (Japan Atomic Energy Research Inst., Tokyo). Oct 1981. 328p. (In Japanese). NTIS (US Sales Only), PC A15/MF A01. Order Number DE83701480.

The program FREC-4A (Fuel Reliability Evaluation Code-version 4A) is used for predicting fuel rod performance in normal reactor operation. The performance is calculated in accordance with the irradiation history of fuel rods. Emphasis is placed on the prediction of the axial elongation of claddings induced by pellet-cladding mechanical interaction, including the influence of initially

preloaded springs inserted in fuel rod lower plenums. In the FREC-4A, an fuel rod is divided into axial segments. In each segment, it is assumed that the temperature, stress and strain are axi-symmetrical, and the axial strain in constant in fuel pellets and in a cladding, though the values in the pellets and in the cladding are different. The calculation of the contact load and the clearance along the length of a fuel rod and the stress and strain in each segment is explained. The method adopted in the FREC-4A is simple, and suitable to predict the deformation of fuel rods over their full length. This report is described on the outline of the program, the method of solving the stiffness equations, the calculation models, the input data such as irradiation history, output distribution, material properties and pores, the printing-out of input data and calculated results.

49080 **(STUDSVIK-NF(P)—82-37) Model-ramp AE, concluding stage. Final report 1981/82.** Malen, K. (Studsvik Energiteknik AB, Nykoeping (Sweden)). 11 Jun 1982. 15p. (In Swedish). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702348.

The results from the international ramping experiments at Studsvik have been compared with models. A review of the experiences from modelling tests is presented.

49081 **(STUDSVIK-NF(P)—82-38) Model-ramp AE, concluding stage. Axial interaction and the relaxation of length of fuel rods as modelled by the computer program SPA2.** Malen, K. (Studsvik Energiteknik AB, Nykoeping (Sweden)). 23 Jun 1982. 12p. (In Swedish). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702349.

The program which was designed to calculate the deformation of a fuel rod during ramping has been supplemented by the model of axial interaction. Thus the variation of the length of a rod, also after ramping can be studied.

49082 **Correction of multigroup cross sections for resolved resonance interference in mixed absorbers.** Williams, M.L. (Oak Ridge National Laboratory, Engineering Physics Division, P.O. Box X Oak Ridge, Tennessee 37830). *Nuclear Science and Engineering;* **83**: No. 1, 37-48(Jan 1983).

The effect that interference between resolved resonances has on averaging multigroup cross sections is examined for thermal reactor-type problems. A simple and efficient numerical scheme is presented to correct a preprocessed multigroup library for interference effects. The procedure is implemented in a "design-oriented" lattice physics computer code and compared with rigorous numerical calculations. The approximate method for computing resonance interference correction factors is applied to obtaining fine group cross sections for a homogeneous uranium-plutonium mixture and a uranium oxide lattice. It was found that some fine group cross sections are changed by more than 40% due to resonance interference. The change in resonance interference correction factors due to burnup of a pressurized water reactor (PWR) fuel pin is examined and found to be small. The effect of resolved resonance interference on collapsed broad group cross sections for thermal reactor calculations is discussed. It is found that the ^{238}U and ^{235}U epithermal cross sections are fairly insensitive to interference effects, but the ^{239}Pu value increases about 3.5% and the ^{240}Pu value decreases by more than 7% for a PWR pin.

2204 Control Systems

REFER ALSO TO CITATION(S) 49794, 49801

49083 **(INIS-mf—7934) Safety concepts and their implications with respect to systems, instrumentation (automatic) control and hardware.** Paziaud, A.; Walther, M. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 19p. (CONF-821039—10). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780712.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

This overview of instrumentation and control in the French Nuclear Power Plants sets out the importance of safety requirements. As a matter of fact, the amount of equipment increases proportionally to the increase in safety requirements, resulting in higher costs in spite of the decrease in the prices of each component owing to the advance in electronics. However the improved reliability should improve the plant capacity factor and, as a consequence, improve both the power output and the safety which is often endangered by minor failures starting severe accidents. (orig.).

49084 **(INIS-mf—7935) Safety concepts and their implications with respect to systems, instrumentation, (automatic) control and hardware. German practice.** Aleite, W. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 16p. (CONF-821039—11). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780713.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

The first German 1300 MW nuclear power plant with a new generation of Leittechnique (IandC) equipment - of graded safety importance and designed on a modular basis - is running in full power operation: Grafenrheinfeld. The graded Leittechnique System is - as the first of its kind - designed according to the German KTA-rule 3501 which was issued in March 77. The System consists of 1) The well-known Reactor Protection System (RPS) 2) Two kinds of safety related Limitation Systems (in IAEA terminology: Limit Controls) 3) Three types of alarms, which are part of the overall Information System in the Main Control Room. 4) The operational Leittechnique Systems with no safety importance (including the highly developped Reactor Control System). It is our opinion that the application of this system of graded safety importance in a NPP is a big step in the direction of more reactor safety and according to the very successful and short commissioning of Grafenrheinfeld and the operation later on, it shows no negative effect on plant availability. (orig./RW).

49085 **(INIS-mf—7937) Reactor limit control system.** Rubbel, F.E. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 38p. (CONF-821039—12). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780714.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

The very extensive use of limitations in the operational field between protection system and closed-loop controls is an important feature of German understanding of operational safety. The design of limitations is based on very large activities in the computational field but mostly on the high level of the plant-wide own commissioning experience of a turnkey contractor. Limitations combine intelligence features of closed-loop controls with the high availability of protection systems. (orig.).

49086 **(INIS-mf—7938) Reactor protection system - design and architecture (French approach).** Dalle, H. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 11p. (CONF-821039—13). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780715.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

This paper provides an overview of the design of a reactor protection system. The defense in depth approach is used to identify the functions of the control system, reactor trip system and the engineered safety features actuation system. The main safety requirements applicable to the protection system are reviewed, and after briefly summarizing protective functions discussed, protection system architecture is described and illustrated by means of a practical example. (orig.).

49087 **(INIS-mf—7939) Annexes to the lecture on reactor protection system including engineered features actuation system.** Palmaers, W. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 81p. (CONF-821039—14). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83780716.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

The present paper deals with the fundamentals for a reactor protection system and discusses the following topics: - System lay-out - Analog measured data acquisition - Analog measured data processing - Limit value generation and logical gating - Procesing of the reactor protection actuation signals - Decoupling of the reactor protection system - Mechanical lay-out - Monitoring system and - Emergency control station. (orig./RW).

49088 **(INIS-mf—7943) Control room design and human engineering in power plants.** Herbst, L. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 39p. (CONF-821039—15). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780717.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

The concept for modern plant control rooms is primary influenced by: the automation of protection, binary control and closed loop control functions; organization employing functional areas; computer based information processing; human engineered design. Automation reduces the human work load. Employment of functional areas permits optimization of operational sequences. Computer based information processing makes it possible to output information in accordance with operating requirements. Design based on human engineering principles assures the quality of the interaction between the operator and the equipment. The degree to which these conceptional features play a role in design of power plant control rooms depends on the unit rating, the mode of operation and on the requirements respecting safety and availability of the plant. (orig.).

49089 **(INIS-mf—7948) Hierarchy and decentralization of I/C-systems.** Scherschmidt, F. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 27p. (CONF-821039—16). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780718.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

The technological process of a nuclear power plant is subdivided into approx. 300 systems, 200 of which are provided with I and C equipment. By means of a functional decentralization, a hierarchical structure i.e. by creation of subsystems as small as possible, the organization of the entire plant becomes highly transparent. The control room facilities are arranged according these organizational aspects. This principles offer the following advantages: - design, manufacture, erection, commissioning can be carried out in steps and independent - the degree of automation can be selected individually for each functional group - fault and disturbances stay limited to small sectional areas. (orig.).

49090 **(INIS-mf—7949) Survey of operational instrumentation and control concepts in nuclear power plants.** Kerlin, T.W. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 23p. (CONF-821039—17). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780719.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

The paper deals with the desirable characteristics, the important measured variables, the instrumentation qualification and with specific instruments used in the field of operational instrumentation and control concepts. (RW).

49091 **(INIS-mf—7950) Characteristics of protective instrumentation.** Reichart, G. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 52p. (CONF-821039—18). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83780720.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

Protective Instrumentation (PI) for Nuclear Power Plants (NPP) is a general term for an highly reliable instrumentation, which provides information for keeping the system within safe limits, for initation of countermeasures in the case of an incident or for mitigation of consequences of an accident. In German NPPs one can find a hierarchical structure of protective instrumentation, wherein the Reactor Protection System (RPS) has the highest priority. To meet the reliability requirements different design principles are used, like - redundancy - diversity - fail safe - decoupling. The presentation gives an overview about the different design principles and characterizes their reliability aspects. As an example for the technical realization the RPS of a German NPP is discussed in some detail. Furthermore some information about other type of PI is given and reliability aspects of the interaction of operating personell with these systems are mentioned. (orig.).

49092 **(INIS-mf—7951) Power supply provisions for instrumentation and control equipment.** Goethe, J.R. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 20p. (CONF-821039—19). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780721.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

Instrumentation and Control systems - one may consider these installations as the nerve system and the brain of a nuclear power plant. According to their supreme importance, power supply for these systems has to be of the highest standard to be found in the plant. In short, I and C power supply systems in nuclear power plants are designed to assure a safe and noninterruptive power supply to I and C equipment under all design basis conditions. The concept as presented here is applied in the KWU 1300 MW PWR plants that are currently being planned or under construction. (orig./RW).

49093 **(INIS-mf—7958) IEC-standards. National regulations.** Kaiser, G. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 38p. (CONF-821039—20). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780722.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

The present paper explains the organizational model of the IEC and discusses the activities of this commission in the field of nuclear instrumentation. (RW).

49094 **(INIS-mf—7959) Instrumentation and control of turbine, generator and associated systems.** Vogtland, U. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 95p. (CONF-821039—21). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83780723.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

The purpose of this presentation is to give some information on Instrumentation and Control (I and C) for turbine-generators, in this case for nuclear application. The I and C scope of supply for such a turbine-generator can be divided as follows: - Closed-loop controls - Turbine stress control systems - Supervisory instrumentation - Protection systems - Open-loop controls. The main systems used for nuclear application are presented by means of examples taken from these a.m. categories. (orig./RW).

49095 **(INIS-mf—7973) Reactor instrumentation and control.** Wach, D. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 56p. (CONF-8009308—13). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83780725.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

The methods for measuring radiation are shortly reviewed. The instrumentation for neutron flux measurement is classified into out-of-core and in-core instrumentation. The out-of-core instrumentation monitors the operational range from the subcritical reactor to full power. This large range is covered by several measurement channels which derive their signals from counter tubes and ionization chambers. The in-core instrumentation provides more detailed information on the power distribution in the core. The self-powered neutron detectors and the aeroball system in PWR reactors are discussed. Temperature and pressure measurement devices are briefly discussed. The different methods for leak detection are described. In concluding the plant instrumentation part some new monitoring systems and analysis methods are presented: early failure detection methods by noise analysis, acoustic monitoring and vibration monitoring. The presentation of the control starts from an qualitative assessment of the reactor dynamics. The chosen control strategy leads to the definition of the part-load diagram, which provides the set-points for the different control systems. The tasks and the functions of these control systems are described.

49096 **(INIS-mf—8011) Reactor control systems.** Fischer, H.D. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 31p. (CONF-821039—23). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780730.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

This report gives a brief description of all closed - loop controls (System YR) in the reactor - Leittechnik for KWU power plants with standard pressurized water reactors of the Grafenrheinfeld series. (orig.).

49097 **(INIS-mf—8012) Operational behaviour of a reactor normal operation and disturbances.** Geyer, K.H. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 33p. (CONF-821039—24). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780731.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

During normal operation, the following topics are dealt with: primary and secondary coolant circuits - full load operation - start-up and shutdown - steady state part load diagramm. During disturbances and incidents, the following procedures are discussed: identification and detection of the events - automatic actions - manual actions of the operator - provided indications - explanation of actuated systems - basic information of reactor protection system. (RW).

49098 (INIS-mf—8131, pp vp) **Investigation of the local neutron noise caused by subcooled boiling.** Mesko, L.; Katona, T. (Hungarian Academy of Sciences, Budapest. Central Research Inst. for Physics:. 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49099 (INIS-mf—8131, pp vp) **Qualification of a reactor as a stochastic two phase flow instrument.** Albrecht, R.W. (Washington Univ., Seattle (USA). Dept. of Nuclear Engineering). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49100 (INIS-mf—8131, pp vp) **Effect of void distribution on micro-leak detection.** Kotona, T.; Uhlmann, G. (Hungarian Academy of Sciences, Budapest. Central Research Inst. for Physics:. 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49101 (INIS-mf—8131, pp vp) **Multivariate signal analysis for process noise source identification.** Bergdahl, B.G. (Studsvik Energiteknik AB, Nykoeping (Sweden)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49102 (INIS-mf—8131, pp vp) **Machine recognition of reactor noise signatures.** Saedtler, E. (Gesellschaft fuer Reaktorsicherheit m.b.H. (GRS), Garching (Germany, F.R.)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49103 (INIS-mf—8131, pp vp) **Use of a decision tree in surveillance neutronic power signal.** Crignon, I.; Dubuisson, B. (Compiegne Univ., 60 (France)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49104 (INIS-mf—8131, pp vp) **Observation of noise signals on a digital controlled screen using the model interpretation.** Schumann, P. (Zentralinstitut fuer Kernforschung, Rossendorf bei Dresden (German Democratic Republic)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49105 (INIS-mf—8131, pp vp) **Neutron noise reduction, analysis, cataloging and trending using BandW's Noise Analysis Lab.** Stevens, D. (Babcock and Wilcox Co., Lynchburg, VA (USA)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49106 (INIS-mf—8131, pp vp) **Transmission and tape recording of fuel element outlet temperature signals.** Edelmann, M.; Massier, H. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49107 (INIS-mf—8131, pp vp) **Rise-frequency as a parameter of circulating pump diagnostics.** Pecinka, L. (Skoda, Plzen (Czechoslovakia)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49108 (INIS-mf—8131, pp vp) **Temperature noise analysis of LMFBR subassemblies in dependence on coolant flow and reactor power.** Weinkoetz, G. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Inst. fuer Reaktorbauelemente). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49109 (INIS-mf—8131, pp vp) **Theoretical study of temperature noise for blockage detection in fast reactors.** Firth, D. (UKAEA, Warrington:. 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49110 (INIS-mf—8131, pp vp) **Loose part monitoring - impact sound propagation in real structures.** Olma, B. (Gesellschaft fuer Reaktorsicherheit m.b.H. (GRS), Garching (Germany, F.R.)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49111 (INIS-mf—8131, pp vp) **Experimental experience on acoustic leak detection in sodium heated steam generators.** Foerster, K. (Internationale Atomreaktorbau G.m.b.H. (INTERATOM), Bergisch Gladbach (Germany, F.R.)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49112 (INIS-mf—8131, pp vp) **Recent works on correlation flowmetering in Hungary.** Horanyi, S.; Pallogi, D.; Tozser, S. (Hungarian Academy of Sciences, Budapest. Central Research Inst. for Physics:. 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49113 (NUREG/CR—3331) **Methodology for allocating nuclear power plant control functions to humm or automatic control.** Pulliam, R.; Price, H.E.; Bongarra, J.; Sawyer, C.R.; Kisner, R.A. (BioTechnology, Inc., Falls Church, VA (USA); Oak Ridge National Lab., TN (USA)). Aug 1983. Contract W-7405-ENG-26. 192p. (ORNL/TM—8781). NTIS, PC A09/MF A01 - GPO. Order Number DE83016431.

Portions are illegible in microfiche products.

This report describes a general method for allocating control functions to man or machine during nuclear power plant (NPP) design, or for evaluating their allocation in an existing design. The research examined some important characeristics of the systems design process, and the results make it clear that allocation of control functions is an intractable problem, one which increases complexity of systems. The method is reported in terms of specific steps which should be taken during early stages of a new system design, and which will lead to an optimal allocation at the functional design level of detail.

49114 (RISO-M—2365) **Response times of operators in a control room.** Platz, O.; Rasmussen, J.; Skanborg, P.Z. (Risoe National Lab., Roskilde (Denmark)). Dec 1982. 30p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702331.

A statistical analysis was made of operator response times recorded in the control room of a research reactor during the years 1972-1974. A homogeneity test revealed that the data consist of a mixture of populations. A small but statistically significant difference is found between day and night response times. Lognormal distributions are found to provide the best fit of the day and the night response times.

49115 **IAEA-guidebook on instrumentation and control of nuclear power plants.** Nedelik, A. (Oesterreichisches Forschungszentrum Seibersdorf Ges.m.b.H.). pp vp of Abstracts of the course on 'instrumentation and control of nuclear power plants'. Karlsruhe, Germany; Fachinformationszentrum Energie, Physik, Mathematik (1982). (CONF-821039—Absts).

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

Published in summary form only.

49116 **Abstracts of the course on 'instrumentation and control of nuclear power plants'.** Karlsruhe, Germany; Kernforschungszentrum (1982). 54p. (CONF-821039—Absts.). Fachinformationszentrum Energie, Physik, Mathematik, Karlsruhe, Germany.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

Separate abstracts are presented for each of the papers included in the data base.

2205 Environmental Aspects

REFER ALSO TO CITATION(S) 48661, 48731, 48734, 48958, 50092, 50093

49117 (INIS-mf—7498, pp vp) **Radial power distribution optimization in seed-blanket reactors.** Ronen, Y.; Regev, D.; Goldfeld, A.; Radkowsky, A. 1982. NTIS (US Sales Only), PC A12/MF A01. (CONF-820268—Vol.9-Summ.).

From Nuclear societies of Israel joint annual meeting; Haifa, Israel (16 Feb 1982).

Published in summary form only.

49118 **(INIS-mf—8029) Decree No 74-945 of 6 November 1974 concerning gaseous radioactive effluent releases from large nuclear installations and nuclear installations located on the same site.** 15 Nov 1974. 2p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780780.

This Decree prescribes the licensing for the release of gaseous wastes from nuclear installations as well as the technical supervision of such operations. It does not apply to the transport of radioactive effluents which is governed by the regulations on the transport of dangerous goods. (NEA).

49119 **(INIS-mf—8035) Decree No 74-1181 of 31 December 1974 concerning liquid radioactive effluent releases from nuclear installations.** 4 Jan 1975. 5p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780781.

Published in the French Official Gazette.

This Decree prescribes the licensing procedure for the release of liquid wastes from nuclear installations as well as the technical supervision of such operations. It does not apply to the transport of radioactive effluents which is governed by the regulations on the transport of dangerous goods. (NEA).

49120 **(PB—83-204941) Systems study of regional air transport modeling for emergency response applications.** Davis, E.A.; Yoshioka, G.A.; Margulies, T.S. (Johns Hopkins Univ., Laurel, MD (USA). Applied Physics Lab.). Jan 1983. 177p. NTIS, PC A09/MF A01.

This report is a system study of regional air transport modeling as it would apply to nuclear power plant emergency response situations in Maryland, particularly at the Calvert Cliffs site on the Chesapeake Bay. Prepared for the Power Plant Siting Program, it reviews Maryland requirements and several available models and modeling systems that could be used to satisfy those requirements. A generic emergency response modeling system is defined and then two specific examples are discussed, the ARAC system and the MIDAS system, both of which are particularly relevant to Maryland applications. The meteorology and topography of the State is discussed as it poses special conditions for regional transport modeling. A brief review of regional transport and windfield modeling techniques, as found in several available models, is given. An example of the use of a representative diagnostic windfield model (MESOPAC) is given based on meteorological sources around the Chesapeake Bay. The report develops a perspective on how Maryland might improve its capability to analyze in real time the potential consequences of an accident.

49121 **An analysis of dry active waste production rates.** Nelson, R.A.; Naughton, M.D. (Sargent & Lundy Engineers, 55 East Monroe Street, Chicago, IL 60603). *Transactions of the American Nuclear Society;* **43**: 97-98(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

49122 **The Nordic study on reactor waste.** Tveten, U. (Institute for Energy Technology, 2007 Kjeller). *Transactions of the American Nuclear Society;* **43**: 108(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

49123 **Identification of radwaste sources and reduction techniques, EPRI project RP1557-3.** Deltele, C.P.; Naughton, M.D.; Wilson, R.B. (Gilbert Associates, P.O. Box 1498, Reading, PA 19603). *Transactions of the American Nuclear Society;* **43**: 133(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

49124 **Overview and update on waste management issues at TMI-2.** Daniels, R.S.; McIntosh, T.W.; Reilly, J.K. (Bechtel National Inc., 15740 Shady Grove Road, Gaithersburg, MD 20760). *Transactions of the American Nuclear Society;* **43**: 141-142(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

2206 Research, Test, And Experimental Reactors

REFER ALSO TO CITATION(S) 48975, 49114, 49136, 49189, 49193

49125 **(DOE/SF/75008—T7) Practical technological benefits of SRE decommissioning.** Ureda, B.F.; Conners, C.C.; Kittinger, W.D. (Rockwell International Corp., Canoga Park, CA (USA). Energy Systems Group). 1982. Contract AT03-76SF75008. 6p. (CONF-820705—15). NTIS, PC A02/MF A01. Order Number DE83016075.

From 2. joint ASME/ANS nuclear engineering conference; Portland, OR, USA (25 Jul 1982).

The decommissioning of the Sodium Reactor Experiment is essentially complete. Contaminated materials, equipment, and soil were removed, decreasing the residual radioactivity to levels acceptable for future unrestricted use of the site. The fuel was removed and declad, tooling and techniques to support the decommissioning were developed, bulk sodium and residual sodium films were removed, coolant systems were dismantled, the reactor vessel was dissected, the interior surfaces of the facilities were decontaminated, and waste materials were packaged and shipped to burial sites. Radiation exposure to workers and the public was within the guidelines and as low as reasonably achievable. In performing the project, new decontamination techniques were tested, decontamination equipment was evaluated, and waste disposal methods were developed.

49126 (INIS-mf—8131, pp vp) **Analysis of reactivity noise measured at KNK II with respect to vibrations of control rods and primary loop components.** Mitzel, F.; Ansary, S.; Vaeth, W. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49127 (INIS-mf—8131, pp vp) **Neutron noise measurement in swimming pool type reactor.** Ansari, S.A. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49128 (INIS-mf—8131, pp vp) **Measurement of the xenon poisoning at a swimming pool reactor by on-line neutron noise analysis.** Behringer, K.; Lescano, H.V. (Eidgenoessisches Inst. fuer Reaktorforschung, Wuerenlingen (Switzerland)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49129 **(NUREG/CR—3336) Evaluation of nuclear-facility decommissioning projects. Summary report: Ames Laboratory Research Reactor.** Link, B.W.; Miller, R.L. (UNC Nuclear Industries, Inc., Richland, WA (USA). Decommissioning Programs Dept.). Jul 1983. 47p. NTIS, PC A03/MF A01 - GPO $3.75. Order Number DE83902762.

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This document summarizes the available information concerning the decommissioning of the Ames Laboratory Research Reactor (ALRR), a five-megawatt heavy water moderated and cooled research reactor. The data were placed in a computerized information retrieval/manipulation system which permits its future utilization for purposes of comparative analysis. This information is presented both in detail in its computer output form and also as a manually assembled summarization which highlights the more important aspects of the decommissioning program. Some comparative information with reference to generic decommissioning data extracted from NUREG/CR 1756, Technology, Safety and Costs of Decommissioning Nuclear Research and Test Reactors, is included.

49130 **(ORNL/TM—8834) Bulk Shielding Facility quarterly report, January, February, and March 1983.** Corbett, B.L.; Lance, E.D. (Oak Ridge National Lab., TN (USA)). Aug 1983. Contract W-7405-ENG-26. 15p. NTIS, PC A02/MF A01. Order Number DE83016462.

The BSR remained shut down the entire quarter for the preparation and fiberglassing of the pool walls and floor. This accounted for 100% of the downtime during January, February, and March.

49131 **Research, training, test and production reactor directory.** Burn R.R. (ed.). La Grange Park, IL; American Nuclear Society (1983). 833p. (DOE/ER/75033—1). American Nuclear Society, 555 N. Kensington Ave., La Grange Park, IL 60525. Contract FG02-82ER75033.

The American Nuclear Society RESEARCH, TRAINING, TEST, AND PRODUCTION REACTOR DIRECTORY is a comprehensive collection of administrative, operational, and technical data for all non-power reactors in the United States of America. Because of close ties, McMaster University Reactor in Hamilton, Ontario, Canada has also been included. The first edition, issued in 1980, listed 129 operating reactors, 94 shutdown reactors, three facilities not yet in operation, and three facilities in standby status. This 1983 edition provides data that is accurate as of January 1983. The compilation includes 124 operating reactors and 137 shutdown reactors dating back to the original Chicago pile. The text is divided into Part I: Operating Reactors and Part II: Shutdown Reactors. A map at the beginning of Part I locates the 124 operating reactors throughout the United States. Reactors are listed alphabetically: first by laboratory, university, or industrial organization; second, by reactor name.

2207 Plutonium And Isotope Production Reactors

REFER ALSO TO CITATION(S) 48975, 49131, 49812

49132 **(UNI-SA—106) Vibration monitoring using a computer-network approach.** Harrington, T.P.; Roblyer, S.P.; Toffer, H. (UNC Nuclear Industries, Inc., Richland, WA (USA)). 1 Apr 1983. Contract AC06-76RL01857. 16p. (CONF-830928—1). NTIS, PC A02/MF A01. Order Number DE83012123.

From 9. ASME biennial conference on mechanical vibration and noise; Dearborn, MI, USA (12 Sep 1983).

A new approach to vibration monitoring utilizing microprocessor based data acquisition stations, a large minicomputer, and a computer network methodology is being developed by UNC Nuclear Industries. In this approach, semi-autonomous data collection stations referred to as satellite stations are located near each concentration of machinery to be monitored. The satellite stations provide near continuous monitoring of the machinery. They are linked to the minicomputer using voice grade telephone circuits and hardware and software specifically designed for network communications. The communications link between the satellite stations and the minicomputer permits data and programs to be transmitted between the units. For example, vibration data can be collected by the satellite stations and transmitted to the minicomputer for long-term trend analysis or sophisticated signature analysis.

2209 Reactor Safety

REFER ALSO TO CITATION(S) 48739, 49047, 49120, 49767, 49903, 49910

49133 **(CONF-830932—5) Turbulence modeling of thermal and fluid mixing in PWR's during high-pressure coolant injection using COMMIX-1B.** Chen, F.F.; Domanus, H.M.; Sha, W.T. (Argonne National Lab., IL (USA)). 1983. Contract W-31-109-ENG-38. 8p. NTIS, PC A02/MF A01. Order Number DE83014742.

From International conference on numerical methods in nuclear engineering; Montreal, Canada (6 Sep 1983).

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The purpose of this study is to analyze the thermal and fluid mixing in a pressurized water reactor during the high pressure coolant injection (HPI). The postulated consequence of the primary side overcooling is generally referred to as thermal shock. Recently, there has been several publications discussing the effect of primary side overcooling on reactor vessel integrity. When the ratio of loop flow to HPI flow is high, the Reynolds number is generally high, the Froude number is small, and the agreement between experimental results and numerical prediction is poor without the proper turbulence modeling. In this case, near the injection, both buoyancy effects amd turbulence mixing are very important. The 2-equation (κ-ϵ) turbulence modeling proposed by Launder and Spalding and modified by Sha and Launder is used for the present model with some modifications. The current calculations were performed using COMMIX-1B, an extended version of the COMMIX-1A computer code.

49134 **(DOE/DP/00789—T24) Feasibility study for adding a demand failure data collection system to the Nuclear Plant Reliability Data System. Final report.** Tashjian, B.M.; Logan, B.W. (Southwest Research Inst., San Antonio, TX (USA). Engineering Analysis Services; Duke Power Co., Charlotte, NC (USA). Design Engineering Dept.). Jul 1983. Contract AC04-76DP00789. 86p. NTIS, PC A05/MF A01. Order Number DE83016281.

Southwest Research Institute (SwRI) is pleased to submit to Sandia National Laboratories this technical report as fulfillment of Task 5 of the proposal entitled A Feasibility Study for Adding a Duty Cycle Data Collection System to the Nuclear Plant Reliability Data System. The purpose of this report is to summarize the work as delineated in the proposal tasks and to recommend follow-on activities. Technical support for this work was provided by Duke Power Company (Duke), subcontractor to SwRI. The four tasks to be performed in conjunction with the Duty Cycle Data Collection Study (renamed in this report Demand Data Collection) were: define component population and measurable parameters; develop data collection and assessment methodologies; assess the impact on utilities; and assess the impact on NPRDS.

49135 **(ECN—126) Fast reactor type fuel pins tested under loss of flow conditions. Data compilation of R63 experiments L01-L19.** Kwast, H. (Stichting Energieonderzoek Centrum Nederland, Petten). Nov 1982. 302p. NTIS (US Sales Only), PC A14/MF A01. Order Number DE83702334.

The experimental programme on Fast Reactor Safety, in progress at ECN Petten, The Netherlands, includes irradiations of single fuel pins in sodium filled capsules under simulated loss of coolant flow conditions. The main objectives are to determine the failure modes, mechanisms, thresholds and consequences of fuel pin failures. This report gives a survey of the programme, a description of the experiments and the results of 19 experiments of which seven were performed with a pre-irradiated fuel pin. The results include: temperature and pressure measurements, neutron radiography, X-ray photography, gamma scanning, visual inspection and microscopy on cross sections.

49136 **(HEDL-SA—2876) Fast Flux Test Facility emergency planning.** Moffitt, W.C.; Newland, D.J. (Hanford Engineering Development Lab., Richland, WA (USA)). Jul 1983. Contract AC06-76FF02170. 38p. (CONF-830818—4). NTIS, PC A03/MF A01. Order Number DE83016386.

From 11. biennial topical conference on reactor operating experience - plant startup and operations in the 80's; Scottsdale, AZ, USA (1 Aug 1983).

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This paper describes the emergency planning structure and experience at the Fast Flux Test Facility (FFTF). The FFTF is a 400-MW thermal sodium-cooled, three-loop, fast test reactor operated by Westinghouse Hanford Company (WHC) for the US Department of Energy (DOE) as part of the Hanford Engineering Development Laboratory facilities twelve miles north of Richland, Washington on the Hanford Reservation. The DOE maintains an overview of the emergency situation and manages all off-site interfaces and keeps the option of taking over, if necessary. WHC has responsibility for the management direction, and control of all on-site emergency resources. This responsibility is carried out through the WHC Emergency Control Center (ECC) in the Hanford 300 Area facilities five miles north of Richland.

49137 (IA—1375, pp 216-217) **Comparative risk assessment of various types of power plants in Israel.** Stern, E.; Tadmor, J. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49138 (IA—1375, pp 34-35) **Preliminary investigation of the core melt-down probability due to an external event.** Knoll, A. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49139 (IA—1375, pp 36) **Investigation of passive iodine removal mechanisms in a condensing environment in a reactor containment after LOCA.** Ben-Haim, Y.; Elias, E. (Technion-Israel Inst. of Tech., Haifa); Keter, A. (Israel Atomic Energy Commission, Tel Aviv). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49140 (IA—1375, pp 37-38) **REMAND and SLAMRR. Computer codes for assessing the radiological risk to the population due to accidents and normal operation of nuclear power plants.** Stern, E.; Stark, M.; Kaufmann, J. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49141 (IA—1375, pp 38) **Guide for using program FPS-81.** Shapira, A. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49142 (IA—1375, pp 40) **Fire barriers in nuclear power plants.** Weissman, A.; Ilberg, D. (Israel Atomic Energy Commission, Tel Aviv); Dayan, A. (Tel Aviv Univ. (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49143 (INIS-BR—05, pp vp) **Recent status of development and practical application of risk analysis in the nuclear field.** Birkhofer, A. (Technische Univ. Muenchen (Germany, F.R.)). Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

The present status of reliability as well as of risk analysis in the field of nuclear safety in the Federal Republic of Germany, is described. An attempt is made to select typical examples rather than to give a complete survey.

49144 (INIS-BR—05, pp vp) **General specification basic safety, basic safety of pressurized components, tanks, apparatus, pipes, pumps and valves.** Kautz, H.R. (Grosskraftwerk Mannheim A.G. (Germany, F.R.)). Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

The general specification items for a safety analysis of the components of the peripheral systems in a PWR, are described. The items analysed are: pumps, valves, pressure vessel and pipes.

49145 (INIS-BR—05, pp vp) **Review of nuclear safety research in the Federal Republic of Germany.** Seipel, H.G. (Bundesministerium fuer Forschung und Technologie, Bonn (Germany, F.R.)). Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

A review of the development of reactor safety research in Federal Republic Germany is presented.

49146 (INIS-BR—05, pp vp) **Reactor safety research at IEN (Instituto de Engenharia Nuclear, Brazil).** Alvim, A.C.M.; Botelho, D.A. (Instituto de Engenharia Nuclear, Rio de Janeiro (Brazil)). Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

The activities and researchs developed at IEN (Instituto de Engenharia Nuclear), Brazil, in the field of reactor safety, are presented.

49147 (INIS-BR—05, pp vp) **German research program integrity of components. Strategy, Goals and First Results.** Kussmaul, K. (Stuttgart Univ. (T.H.) (Germany, F.R.)). Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

The integrity of the reactor pressure vessel including the closed cooling loop ('primary pressure boundary'), is studied.

49148 (INIS-BR—05, pp vp) **Special features of the safety concept and design requirements applied for Angra-2 and 3.** Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

The special features and requirements which have been applied by NUCLEN (Nuclebras Engenharia S/A) for Angra 2 and Angra 3 and which depart somewhat from the KWU (Kraftwerk Union) standard plant, are presented.

49149 (INIS-BR—05, pp vp) **Secondary cycle design considerations for reduction of reactor transients frequency.** Bevilacqua, L.; Leal, M.R.L.V. (PROMON Engenharia S.A., Rio de Janeiro (Brazil)). Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

The secondary cycle systems should not be considered of secondary importance to the pressurized water reactor safety. The advanced design and analysis techniques used for components related to nuclear safety are suggested.

49150 (INIS-BR—05, pp vp) **Reactor safety after TMI (Three-Mile Island).** Smidt, D. (Karlsruhe Univ. (T.H.) (Germany, F.R.)). Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

The present status of safety design in Germany and the governing principles behind it, are presented. The problem of human failure and what could be done about it, are discussed. This is followed by the description of some research projects for further increasing the accident prevention capability of German plants.

49151 (INIS-BR—05, pp vp) **Reliability analysis of Angra I safety systems.** Oliveira, L.F.S. de; Hesles, J.G.S.; Maciel, C.C.; Gibelli, S.M.O.; Fleming, P.V. (Rio de Janeiro Univ. (Brazil). Coordenacao dos Programas de Pos-graduacao de Engenharia); Arrieta, L.A. (Comissao Nacional de Energia Nuclear de Brasil, Rio de Janeiro). Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

A group of individuals formed at COPPE (Coordenacao dos Programas de Pos-graduacao em Engenharia) for reliability studies in nuclear power plants, are presented. The techniques used in that analysis and some examples are presented.

49152 (INIS-mf—7909) **Thermocouples in pressurised water rigs.** Salt, K.J. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 6p. (CONF-8010325—16). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780765.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 3. Paper no. 3.

A description is given of three different applications of thermocouples to large scale heat transfer experiments in pressurised water rigs at AEE Winfrith employing electrically heated fuel pin simulators. One relates to the construction of the simulators and the measurement of internal temperatures during a loss of coolant accident situation; the second refers to sensors to detect the onset of dryout on the surface of directly heated simulators and the third application is for accurate local measurement of fluid temperatures in the sub channels between the pins. Brief details are included of methods adopted for data handling and display for these multichannel applications. (author).

49153 (INIS-mf—7933) **Reliability and availability of instrumentation and control in NPPs.** Fischer, W. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 18p. (CONF-821039—9). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780711.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

The reliability and availability of the instrumentation and control in the nuclear power plants require high demands. As deduced from the safety-philosophy and the availability-aspect the report describes the constructional principles of the instrumentation-equipment and the quality-ensuring arrangements that are applied to the calibrations, the periodical tests and the maintenance and repairing methods at the Biblis Power Plant. Furthermore there are shown some failure rates, as they are determined at Biblis A. (RW).

49154 (INIS-mf—7936) **Seismic instrumentation.** Maubach, K. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 19p. (CONF-821039—28). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780747.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

For better understanding of the specification for seismic instrumentation of a nuclear power plant, the lecture gives some fun-

damental remarks to the seismic risk in the Federal Republic of Germany and to the data characterizing an earthquake event. Coming from the geophysical properties of an earthquake, the quantities are explained which are used in the design process of nuclear power plants. This process is shortly described in order to find the requirements for the specification of the seismic instrumentation. In addition the demands of licensing authorities are given. As an example the seismic instrumentation of KKP-1, BWR, is shown. The paper deals with kind and number of instruments, their location in the plant and their sensitivity and calibration. Final considerations deal with the evaluation of measured data and with plant operation after an earthquake. Some experience concerning the earthquake behaviour of equipment not designed to withstand earthquake loads is mentioned. This experience has initiated studies directed to quantification of the degree of conservatism of the assumptions in the seismic design of nuclear power plants. A final garget of these studies are more realistic design rules. (RW).

49155 **(INIS-mf—7972) Loss of coolant accident (LOCA). LOCA I: Small pipe breaks.** Farber, G. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 93p. (CONF-8009308—12). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83780724.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

The results of the German Risk Study and the events at the TMI reactor plant have revealed the safety-related significance and rank of loss-of-coolant accidents in the event of small breaks in the primary loop. This has led to a broad discussion of the uncontrolled small break incident. However, small breaks can be easily controlled in such a way that not noticeable damage will be caused to the reactor core and no radiation exposure will occur in the environment of the nuclear power plant. The paper attempts to make the event sequence after small pipe breaks plausible. It describes the accident transients for typical breaks, the phenomena characterizing the event sequence as well as the activation and function of the safety features installed for the control of accidents. The state of the analysis technique and of its experimental confirmation are presented. In this context weak spots are identified which must still be compensated today by a suitable choice of conservative assumptions. (orig./RW).

49156 **(INIS-mf—8025) Decision of 27 March 1973, amended on 17 December 1976, 15 June 1978, 23 January 1979, 22 February 1979 concerning Standing Groups responsible for studying the technical aspects of the safety of nuclear installations.** 28 May 1979. 3p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780793.

This Decision originally set up three groups charged with dealing with technical safety problems of nuclear installations. The successive amendments to the Decision change the composition of the groups, now reduced to two, which are responsible for examining such problems connected with the setting up, commissioning, operation and decommissioning of the installations. (NEA).

49157 **(INIS-mf—8031) Decree No 75-196 of 18 March 1975 publishing the Convention Supplementary to the Paris Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy (and Annex), done in Brussels on 31 January 1963 and the Additional Protocol to the Convention of 31 January 1963 Supplementary to the Paris Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy, done in Paris on 28 January 1964.** 27 Mar 1975. 2p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780792.

Published in the French Official Gazette.

This Decree provides for the publication in the Official Gazette of the French Republic of the Brussels Convention, Supplementary to the Paris Convention. (NEA).

49158 **(INIS-mf—8096) Off-site emergency planning.** Narrog, J. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 19p. (CONF-8009308—23). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702772.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

In the event of a nuclear accident, the actions taken to protect the public from off-site consequences must be effective. An effective organization of emergency actions is based on two components: the actions of the operator of the nuclear facility and the actions of the competent authorities. The measures of the operator are of special importance in the first hours after the beginning of the nuclear accident, because there is no other help. Therefore the operator of a nuclear facility shall be obliged under the nuclear licensing procedure to make provisions of his own and carry out protective measures which should be compiled in a so-called 'alarm-plan'. On the other hand the means of the operator are too small in many cases and there is a need for actions by the responsible authorities. The actions of the authorities should be compiled in a so-called 'emergency response plan'. The emergency response plan shall apply to all cases in which, as a result of occurrences in or at a nuclear facility, a damaging impact on the environment is expected or has occurred requiring the authorities in charge to intervene for its prevention or limitation. (orig./RW).

49159 **(INIS-mf—8097) German risk study. Pt. 2. Consequence model and results.** Burkart, K. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 49p. (CONF-8009308—22-Pt.2). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702773.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

A severe nuclear power plant accident can be followed by a considerable release of radioactive effluents into the atmosphere. Due to atmospheric dispersion, areas of different sizes can be contaminated. The corresponding doses can cause early illnesses, early fatalities, latent effects and genetic effects. They are accompanied by economic effects. Within the consequence model of the German Risk Study, early and late fatalities and genetically significant doses are calculated. The calculations are based on real data or phenomena such as the population around 19, present or future German sites, or 115 real weather sequences, as well as on models such as an atmospheric dispersion model, a dose model, a model of protective actions or a health effects model. Within this lecture, the consequence model applied in the German Risk Study will be discussed in detail and the results will be presented. (orig./RW).

49160 **(INIS-mf—8104) Introduction to quality assurance.** Raisic, N. (International Atomic Energy Agency, Vienna (Austria)). (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 12p. (CONF-8009308—35). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702797.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

Safety requirements set forth in the regulatory requirement, codes, standards as well as other requirements for various aspects of nuclear power plant design and operation are strictly implemented through QA activities. The overall QA aim is to assure that the plant is soundly and correctly designed and that it is built, tested and operated in accordance with stringent quality standards and conservative engineering practices. In this way a high degree of freedom from faults and errors can be achieved.

49161 **(INIS-mf—8106) IAEA code and safety guides on quality assurance.** Raisic, N. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 12p. (CONF-8009308—25). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702775.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

In the framework of its programme in safety standards development, the IAEA has recently published a Code of Practice on Quality Assurance for Safety in Nuclear Power Plants. The Code establishes minimum requirements for quality assurance which Member States should use in the context of their own nuclear safety requirements. A series of 10 Safety Guides which describe acceptable methods of implementing the requirements of specific sections of the Code are in preparation. (orig.).

49162 **(INIS-mf—8112) Special characteristics of the safety analysis of BWRs.** Mattern, J. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 44p. (CONF-8009308—26). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702776.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

The boiling water reactor uses the direct cycle. The live steam with 70 bar saturated pressure is given directly to the turbine. The reactor coolant recirculation is performed by means of internal pumps which are directly attached to the vessel bottom. This general arrangement offers some advantages concerning safety analysis. For example, in the case of a loss of coolant accident, the reactor pressure vessel itself forms a refloodable tank, which results, by proper design of the emergency cooling systems, in only a small increase of fuel temperature. (orig./RW).

49163 **(INIS-mf—8113) Fire protection.** Janetzky, E. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 5p. (CONF-8009308—27). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702777.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

Safety and fire prevention measurements have to be treated like the activities developing, planning, construction and erection. Therefore it is necessary that these measurements have to be integrated into the activities mentioned above at an early stage in order to guarantee their effectiveness. With regard to fire accidents the statistics of the insurance companies concerned show that the damage caused increased in the last years mainly due to high concentration of material. Organization of fire prevention and fire fighting, reasons of fire break out, characteristics and behaviour of fire, smoke and fire detection, smoke and heat venting, fire extinguishers (portable and stationary), construction material in presence of fire, respiratory protection etc. will be discussed. (orig./RW).

49164 **(INIS-mf—8115) Overall primary system design.** Schulz, H. (Gesellschaft fuer Reaktorsicherheit m.b.H. (GRS), Koeln (Germany, F.R.)). (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 16p. (CONF-8009308—38). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702800.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

The general design goals for the primary system are: - plant safety, this means protection against catastrophic failure - plant availability, this means a leak-tight system with a high reliability of active components (as pumps, valves) and internal structures. The purpose of this lecture is to show how these general goals are translated into technical requirements. The related criteria, rules and guide-lines necessary for the evaluation of the system are mentioned and discussed in detail as demanded. Special requirements as break assumptions and pipe whip protection are pointed out. The main topic of the lecture is devoted to the focal points in the safety review. The present state of operational experience will be briefly discussed.

49165 **(INIS-mf—8116) On-site emergency planning.** Kueffer, K. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 16p. (CONF-8009308—28). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702778.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

This lecture covers the Emergency Planning of the Operating organization and is based on the Code of Practice and Safety Guides of the IAEA as well as on arrangements in use at the Swiss Nuclear Power Station Beznau and - outlines the basis and content of an emergency plan - describes the emergencies postulated for emergency planning purposes - describes the responsibilities, the organization and the procedures of the operating organization to cope with emergency situations and the liaison between the operating organization, the regulatory body and public authorities - describes the facilities and equipment which should be available to cope with emergency situations - describes the measures and actions to be taken when an emergency arises in order to correct abnormal plant conditions and to protect the persons on-and off-site - describes the aid to be given to affected personnel - describes the aspects relevant to maintaining the emergency plan and organization in operational readiness. (orig./RW).

49166 **(INIS-mf—8117) Management of nuclear power plants for safe operation.** Kueffer, K. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 16p. (CONF-8009308—29). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702779.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

This lecture covers management aspects which have an immediate bearing on safety and identifies the objectives and tasks of management which are required for safe operation of a nuclear power plant and is based on the Codes of Practice and Safety Guides of the IAEA as well as arrangements in use at the Swiss Nuclear Power Station Beznau. This lecture - discusses the factors to be considered in structuring the operating organization, the support to be provided to plant management, the services and facilities needed and the management system for assuring the safety tasks are performed - describes the responsibilities of plant management and operating organization - outlines the requirements for recruitment, training and retraining as well as qualification and authorization of personnel - describes the programmes for maintenance, testing, examination, inspection, radiological protection, quality assurance, waste management, fuel management, emergency arrangement and security - describes the development of plant operating procedures including procedures to protect the personnel - outlines the requirements for initial and subsequent operation - describes the importance for evaluation and feedback of operating experience - describes the procedures for changes in hardware, procedures and set points - outlines the information flow and the requirements in reference to records and reports. (orig./RW).

49167 **(INIS-mf—8118) Dynamic loads on the primary system.** Rohde, J. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 61p. (CONF-8009308—30). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702780.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

As a result of pipe breaks f.ex. in the primary system of a PWR-plant dynamic forces act on the components of the system as well as on their support-structures and internals. The design basis must guarantee that LOCA or system-transient generated loads cannot produce deformations or fractures that endanger the coolability of the reactor, the emergency feedwater supply to the core-region and a safe shut-down of the reactor. In this lecture the first part of a LOCA will be discussed, where the highest dynamic loads on the primary system are expected. In this connection comments are given on the main assumptions and boundary conditions, the related regulations and guide-lines, as well as the possible consequences of an accident. Next, a review is presented of the analytical methods being used for the determination of thermohydraulic generated loads. The stress-calculations on the basis of these load-functions are discussed in the following lectures. The application of the analytical methods, i.e. the different computer codes, and the verification on the basis of the experimental results are described together with a discussion of the theoretical results. In addition a survey will be given of the research work done in connection with the problems of the dynamic loads under accident conditions. Finally, the problems of the fluid-structure interaction will be explained and comments made on computer code development now under way regarding this problem. A short film will be presented to provide a better understanding of fast transient phenomena. (orig./RW).

49168 **(INIS-mf—8121) Seismic analysis of design.** Jehlicka, P. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 22p. (CONF-8009308—31). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702781.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

The determination of the dynamic response of nuclear power plants is a necessary part of safe design against earthquake, or against other additional vibrational loading. The determination of these dynamic loads caused by external excitation is a requirement in calculating the related material loading on the structures. The purpose of this lecture is to present a general survey of analytical methods to determine the response of structural and mechanical equipment to earthquake. The main problems which complicate structural-dynamic calculations will be discussed. The necessity to control input parameters and the possibility to calculate with simplified methods will be pointed out. (orig./RW).

49169 **(INIS-mf—8127) Special characteristics of the safety analysis of HWRs.** Kugler, G. (Atomic Energy of Canada Ltd., Mississauga, Ontario:. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. vpp. (CONF-8009308—45). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702807.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

Two lectures are presented in this report. The CANDU-PHW reactor is used as a model for discussion. The first lecture describes the distinctive features of the CANDU reactor, and how they impact on reactor safety. In the second lecture the Canadian safety philosophy, the safety design objective, and other selected topics on reactor safety analysis are discussed. The material in this report was selected with a view to assisting those not familiar with the CANDU heavy water reactor design in evaluating the distinctive safety aspects of these reactors. .

49170 **(INIS-mf—8129) Work session on the SAR. Pt. 1.** Burkart, K. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 67p. (CONF-8009308—32-Pt.1). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702782.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

In the first part of the present paper, containment isolation, pressurizer systems, valves of coolant systems and volume control systems are described. In the second part residual heat removal systems and the water-steam cycle are dealt with. Then initiation criteria and safety actions as well as malfunctions in the feedwater supply are discussed and finally leakages from the pressurized boundary of the reactor cooling system due to ruptures in connection lines and valve malfunction are considered. (RW).

49171 **(INIS-mf—8130) Work session on the SAR. Pt. 2. Tables.** Burkart, K. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 32p. (CONF-8009308—32-Pt.2). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702783.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

The present paper contains the tables of the contribution of K. Burkart 'Work Session on the SAR' to the IAEA Interregional Training Course held in Sept/Oct. 1980 at the Kernforschungszentrum Karlsruhe. (RW).

49172 (INIS-mf—8131, pp 33) **Fluid-velocity measurements and flow-pattern-identification in reactor safety experiments.** Luebbesmeyer, D. (Eidgenoessisches Inst. fuer Reaktorforschung, Wuerenlingen (Switzerland)). 23 Apr 1981. NTIS (US Sales Only), PC A03/MF A01. (CONF-8104162—Absts.).

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

49173 **(INIS-mf—8131) 14. informal meeting on reactor noise. Abstracts.** (Gesellschaft fuer Reaktorsicherheit m.b.H. (GRS), Garching (Germany, F.R.)). 23 Apr 1981. 33p. (CONF-8104162—Absts.). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83781074.

From 14. informal meeting on reactor noise; St. Englmar, F.R. Germany (28 Apr 1981).

Individual papers are included in the data bases.

49174 **(INIS-mf—8138) Reliability assessment of the containment of a PWR. Main report and appendix.** Schueller, G.I. (Innsbruck Univ. (Austria). Inst. fuer Mechanik); Kafka, P.; Berning, A. (Gesellschaft fuer Reaktorsicherheit m.b.H. (GRS), Garching (Germany, F.R.)); Wellein, R. (Kraftwerk Union A.G., Erlangen (Germany, F.R.)); Wittmann, F.H.; Boulahdour, T. (Ecole Polytechnique Federale, Lausanne (Switzerland)); Mihashi, M. (Tohoku Univ., Sendai (Japan). Dept. of Architecture); Zorn, N.F.; Bauer, J. (Technische Univ. Muenchen (Germany, F.R.). Inst. fuer Bauingenieurwesen 3 - Massivbau, Stahlbau). Sep 1981. 572p. (In German). NTIS (US Sales Only), PC A24/MF A01. Order Number DE83702811.572

In two volumes.

The aim of this research effort was to contribute to the development of methods to quantify the risk involved with nuclear power plants. Using a large component, i.e. the containment of the reference plant BIBLIS B (PWR) as sample structure a reliability analysis was performed which is based on realistic assumptions of loads and material properties. For this purpose in many fields it was necessary to develop new methods, collect data, and where not available, obtain data in tests. This effort concentrated on partial aspects and on the other hand on the development of a methodology for an overall reliability concept. According to the results of the previous project, the keypoints of this effort are the treatment of loss of coolant accidents (small leak), earthquake loading, the possibly resulting crackpropagation in the steel hull, and the structural mechanics and material strength aspects of the reinforced concrete hull subjected to impact loading (aircraft impact).

49175 **(INIS-mf—8155) Safety strategy and its technical realization.** Franzen, L.F. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1981. 22p. (CONF-8109220—1). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702784.

From IAEA interregional training course on nuclear power plant operational safety; Karlsruhe, F.R. Germany (7 Sep 1981).

Main goal of the nuclear safety strategy is to avoid an unbalance between heat generation and heat removal in all operating states. Such unbalance could result from transient in which either the heat generation exceeds the nominal values or the heat removal falls below these values. Another cause could be loss of coolant accident in which the coolant required for the heat removal is lost, totally or partially. The available safety systems provide, eventually after shutdown of the reactor, for the re-establishment of the balance between heat generation and heat removal. They serve as back-up for the normal process system which are already contributing to safety. Generally speaking, the very essence of the safety provisions is to make the occurrence of accident conditions unprobable and to prevent the occurrence of emergency situations. In the implementation of this strategy, the defence-in-depth approach is applied. Its first line can be described with such terms as 'basic safety and quality assurance', the second line with 'accident prevention' and the third line with 'consequence mitigation'. (orig.).

49176 **(IS-M—416) Uncertainty analysis of containment seismic resistance.** Greimann, L.F.; Fanous, F.S.; Ketelaar, D.D. (Ames Lab., IA (USA)). 1983. Contract W-7405-ENG-82. 8p. (CONF-830805—48). NTIS, PC A02/MF A01. Order Number DE83016517.

From 7. international conference on structural mechanics in reactor technology; Chicago, IL, USA (22 Aug 1983).

Portions are illegible in microfiche products. Original copy available until stock is exhausted.

Because of the possibility of leakage of any radioactivity which may accidentally be present within a nuclear power plant containment vessel, a best estimate of the containment resistance is required. This paper represents a portion of a project sponsored by the USNRC, the objective of which is to assess the uncertainty of the containment resistance to seismic and other types of loading. The present work is to characterize the statistical properties of the vessel resistance to seismic excitation. The results yield the cumulative probability distribution of the structural system resistance, i.e., fragility curve. For seismic analysis, the earthquake input is often specified in terms of a design response spectrum. In this paper, a random vibration analysis technique is presented which is calibrated

to a standard design response spectrum. The ground excitation is considered to be a non-stationary random process. Failure of a structural system is defined as a point beyond which the system does not satisfy the conditions for which it was intended. Performance of the containment vessel is evaluated in terms of maximum strains. The buckling analysis of the containment vessel is performed using the BOSOR computer code.

49177 **(JAERI—1277) ROSA-II experimental program for PWR LOCA/ECCS integral tests.** Adachi, H.; Okazaki, M.; Sobajima, M.; Suzuki, M.; Tasaka, K.; Soda, K.; Shiba, M. (Japan Atomic Energy Research Inst., Tokyo). Mar 1982. 154p. NTIS (US Sales Only), PC A08/MF A01. Order Number DE83702428.

This paper is the final report of the ROSA-II experimental program, in which summary of the integral test results on thermal hydraulic behavior in a loss-of-coolant accident (LOCA) of pressurized water reactor (PWR) and on the effect of emergency core cooling system (ECCS) is presented. The ROSA-II test facility has a volume scaling factor of approximately 1/400 and core heating power of 2.4 MW. Specific feature of the facility is the versatility of the break conditions, the ECCS injection conditions and the secondary system conditions. After numbers of integral tests under various test conditions, (1) condensation-depressurization effect due to ECC water, (2) stored heat release from the structural materials and (3) counter current flow limitation (CCFL) at the specific locations were found to be important phenomena for the core cooling. To supply cooling water as soon as possible to the core was indicated to be very important for successful core cooling. Based on these results, more effective ECCS was proposed and the effectiveness of the proposed ECCS was experimentally verified. On the other hand, part of the experimental data was utilized to evaluate the predictability of RELAP-3 and RELAP-4J computer codes.

49178 **(JAERI-M—82-003) Characteristics of cross flow in a rod bundle.** Osakabe, M.; Adachi, H. (Japan Atomic Energy Research Inst., Tokyo). Mar 1982. 21p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702425.

Recently two-dimensional two-phase flow in the core of a light water reactor (LWR) has been receiving more attention especially in respect to the loss of coolant accident (LOCA). In this accident the two-phase cross flow occurs between the subchannels in the rod bundle. In analysis of this penomenon, the pressure loss of cross flow passing through the rod bundle is one of the important factors. An air/water loop operated at the atmospheric pressure was designed and constructed in an initial attempt to characterize the two-phase cross flow. The single-phase flow and the two-phase flow passing through the rod bundle with an attack angle phi against the axes of rods was studied. The pressure for the three different attack angles was measured. The single-phase pressure loss was compared with the same type model as that used in the COBRA-IV Code and the two-phase differential pressure was compared with the homogeneous and the drift flux models.

49179 **(JAERI-M—82-015) High temperature deformation behavior of gradually pressurized zircaloy-4 tubes.** Suzuki, M. (Japan Atomic Energy Research Inst., Tokyo). Mar 1982. 24p. (In Japanese). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702429.

In order to obtain preliminary perspectives on fuel cladding deformation behavior under changing temperature and pressure conditions in a hypothetical loss-of-coolant accident of PWR, a Zircaloy-4 tube burst test was conducted in both air and 99.97% Ar atomospheres. The tubes were directly heated by AC-current and maintained at various temperatures, and pressurized gradually until rupture occurred. Rupture circumferential strains were generally larger in Ar gas than in air and attained a maximum around 1100 K in both atmospheres. Some tube tested in air produced axially-extended long balloons, which proved not to be explained by such properties or ideas as effect of cooling on strain rate, superplasticity, geometrical plastic instability and stresses generated by surface oxide layer. A cause of the long balloon may be obtained in the anisotropy of the material structure. But even a qualitative analysis based on this property can not be made due to insufficient data of the anisotropy.

49180 **(JAERI-M—82-017) Report on operation utilization and technical development of research reactors and hot laboratory. April 1, 1980 to March 31, 1981.** (Japan Atomic Energy Research Inst., Tokyo). Mar 1982. 234p. (In Japanese). NTIS (US Sales Only), PC A11/MF A01. Order Number DE83702433.

Activities of the Division of Research Reactor Operation in fiscal 1980 are described. The division is responsible for operation and maintenance of JRR-2, JRR-3, JRR-4 and Hot Laboratory. In the above connection, various other works are performed, including technical management of fuel and coolant, radiation control, irradiation technique, etc. In Hot Laboratory, postirradiation examinations of fuels and materials are made, and also development of examination methods.

49181 **(JAERI-M—82-022) Pipe rupture test results; 4 inch pipe whip test under BWR LOCA conditions. Overhang length parameter tests (RUN 5407, 5501, 5504, 5603).** Kurihara, R.; Ueda, S.; Isozaki, T.; Miyazaki, N.; Kato, R.; Miyazono, S.; Saito, K. (Japan Atomic Energy Research Inst., Tokyo). Mar 1982. 72p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702426.

Pipe whip tests or jet discharge tests have been performed in JAERI, which simulate the instantaneous circumferential guillotine break of primary coolant piping in nuclear power plants. This report summarizes the results of 4 inch pipe whip tests (RUN 5407, 5501, 5504, 5603), under BWR LOCA conditions, which were performed from 1979 to 1981. The test pressure was 6.8 MPa and test temperature 285°C. In these tests clearance was kept constant at the value of 100 mm and overhang length were 250 mm, 400 mm, 550 mm and 1000 mm, respectively. The main purpose of these tests was to investigate the effect of overhang length on pipe whip behavior. From the tests results, a shorter overhang length is recommended to minimize the deformation of the pipe and restraints.

49182 **(JAERI-M—82-028) Analysis of LOFT L3-6/L8-1 with THYDE-P. CSNI international standard problem no. 11 and THYDE-P sample calculation Run 60.** Hirano, M. (Japan Atomic Energy Research Inst., Tokyo). Mar 1982. 92p. NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702430.

This report contains results from the best-estimate post-test analysis using the THYDE-P computer code to simulate the coupled system thermal hydraulic responses of LOFT nuclear small break experiment L3-6 and the first severe core transient experiment L8-1. The experiment was selected as OECD-CSNI International Standard Problem No. 11. Also, the present calculation was performed as Sample Calculation Run 60, which was part of the series of the THYDE-P Sample Calculations.

49183 **(JAERI-M—82-038) User's manual for THYDE-P1.** Asahi, Y. (Japan Atomic Energy Research Inst., Tokyo). Apr 1982. 60p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702447.

THYDE-P1 is a computer code applicable to LWR (light water reactor) plant dynamics in response to various disturbances. This work is the user's mannual of THYDE-P1 (version SV02L03). The input requirements, steady state adjustment, execution of runs and output specifications are described.

49184 **(JAERI-M—82-039) Present status and needs of research on severe core damage. Severe core damage research task force.** (Japan Atomic Energy Research Inst., Tokyo). May 1982. 210p. (In Japanese). NTIS (US Sales Only), PC A10/MF A01. Order Number DE83702412.

The needs for research on severe core damage accident have been emphasized recently, in particular, since TMI-2 accident. The Severe Core Damage Research Task Force was established by the Divisions of Reactor Safety and Reactor Safety Evaluation to evaluate individual phenomenon, to survey the present status of research and to provide the recommended research subjects on severe accidents. This report describes the accident phenomena involving some analytical results, status of research and recommended research subjects on severe core damage accidents, divided into accident sequence, fuel damage, and molten material behavior, fis-

sion product behavior, hydrogen generation and combustion, steam explosion and containment integrity.

49185 **(JAERI-M—82-073) CCTF CORE I test results.** Murao, Y.; Sudoh, T.; Akimoto, H.; Iguchi, T.; Sugimoto, J.; Fujiki, K.; Hirano, K. (Japan Atomic Energy Research Inst., Tokyo). Jul 1982. 36p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702431.

This report presents the results of the following CCTF CORE I tests conducted in FY 1980: multi-dimensional effect test; evaluation model test; and FLECHT coupling test. On the first test, one-dimensional treatment of the core thermohydrodynamics was discussed. On the second and third tests, the test results were compared with the results calculated by the evaluation model codes and the results of the corresponding FLECHT-SET test (Run 2714B), respectively. The work was performed under contracts with the Atomic Energy Bureau of Science and Technology Agency of Japan.

49186 **(LA-UR—83-963) Fuel models and results from the TRAC-PF1/MIMAS TMI-2 accident calculation.** Schwegler, E.C.; Maudlin, P.J. (Los Alamos National Lab., NM (USA)). 1983. Contract W-7405-ENG-36. 4p. (CONF-830816—10). NTIS, PC A02/MF A01. Order Number DE83015240.

From International meeting on light-water reactor severe accident evaluation; Cambridge, MA, USA (28 Aug 1983).

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A brief description of several fuel models used in the TRAC-PF1/MIMAS analysis of the TMI-2 accident is presented, and some of the significant fuel-rod behavior results from this analysis are given. Peak fuel-rod temperatures, oxidation heat production, and embrittlement and failure behavior calculated for the TMI-2 accident are discussed. Other aspects of fuel behavior, such as cladding ballooning and fuel-cladding eutectic formation, were found not to significantly affect the accident progression.

49187 **(LALP—83-25) Numerical calculations of hydrogen-air combustion.** O'Rourke, P.J. (Los Alamos National Lab., NM (USA)). Aug 1983. Contract W-7405-ENG-36. 4p. NTIS, PC A02/MF A01. Order Number DE83016508.

One serious concern during the accident at Three Mile Island resulted from the generation of a large amount of hydrogen gas and its migration to the containment building. The fear was that combustion of this hydrogen could produce pressures that would breach containment. The Center for Nonlinear Studies at Los Alamos is sponsoring an effort to assess the Laboratory's current numerical capabilities to model the combustion of hydrogen-air mixtures in realistic geometries. Such detailed numerical models allow us to understand very complex experimental behavior.

49188 **(NUREG—0675-Suppl.No.18) Safety-evaluation report related to the operation of Diablo Canyon Nuclear Power Plants, Units 1 and 2. Docket Nos. 50-275 and 50-323. Supplement No. 18.** (Nuclear Regulatory Commission, Washington, DC (USA). Office of Nuclear Reactor Regulation). Aug 1983. 215p. NTIS, PC A10/MF A01 - GPO $6.50. Order Number DE83902764.

Supplement 18 to the Safety Evaluation Report for Pacific Gas and Electric Company's application for licenses to operate Diablo Canyon Nuclear Power Plants, Units 1 and 2 (Docket Nos. 50-275 and 50-323), has been prepared by the Office of Nuclear Reactor Regulation of the US Nuclear Regulatory Commission. This supplement reports on the verification effort for Diablo Canyon Unit 1 that was performed between November 1981 and the present in response to Commission Order CLI-81-30 and an NRC letter to the licensee.

49189 **(NUREG—0984) Safety-evaluation report related to the renewal of the operating license for the Cornell University TRIGA Research Reactor. Docket No. 50-157.** (Nuclear Regulatory Commission, Washington, DC (USA). Office of Nuclear Reactor Regulation). Aug 1983. 80p. NTIS, PC A05/MF A01 - GPO $4.50. Order Number DE83902771.

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This Safety Evaluation Report for the application filed by the Cornell University for a renewal of Operating License R-80 to continue to operate a research reactor has been prepared by the Office of Nuclear Reactor Regulation of the US Nuclear Regulatory Commission. The facility is owned and operated by Cornell University and is located on the Cornell campus in Ithaca, New York. The staff concludes that the TRIGA reactor facility can continue to be operated by Cornell without endangering the health and safety of the public.

49190 **(NUREG/CR—2148-Add.) FRAP-T6: a computer code for the transient analysis of oxide fuel rods.** Siefken, L.J.; Shah, V.N.; Berna, G.A.; Hohorst, J.K. (EG and G Idaho, Inc., Idaho Falls (USA)). Jun 1983. Contract AC07-76ID01570. 71p. (EGG—2104-Add.). NTIS, PC A04/MF A01 - GPO. Order Number DE83015852.

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FRAP-T6 is a computer code which is being developed to calculate the transient behavior of a light water reactor fuel rod. This report is an addendum to the FRAP-T6/MODO user's manual which provides the additional user information needed to use FRAP-T6/MOD1. This includes model changes, improvements, and additions, coding changes and improvements, change in input and control language, and example problem solutions to aid the user. This information is designed to supplement the FRAP-T6/MODO user's manual.

49191 **(NUREG/CR—2874-Vol.4) High-temperature gas-cooled reactor safety studies for the division of accident evaluation. Quarterly progress report, October 1-December 31, 1982.** Ball, S.J.; Clapp, N.E. Jr.; Cleveland, J.C.; Conklin, J.C.; Harrington, R.M.; Lindemer, T.B.; Siman-Tov, I. (Oak Ridge National Lab., TN (USA)). Aug 1983. Contract W-7405-ENG-26. 24p. (ORNL/TM—8443/V4). NTIS, PC A02/MF A01 - GPO. Order Number DE83016221.

Work continued on high-temperature gas-cooled reactor safety code development, including both the Fort St. Vrain and the 2240-MW(t) lead plant versions of the three-dimensional core code ORECA, the BLAST steam generator code, and a simplified core model code called SCORE. Oak Ridge National Laboratory participated in the Nuclear Regulatory Commission siting study for the lead plant with three other laboratories. Investigations continued to determine the status of fission-product source-term methodology applicable to postulated severe accidents.

49192 **(NUREG/CR—3085/2-App.) Interim reliability evaluation program: analysis of the Millstone Point Unit 1 Nuclear Power Plant. Volume II. Appendix A and B.1 through B.4.** Amico, P.J. (Science Applications, Inc., Bethesda, MD (USA)). May 1983. Contract AC04-76DP00789. 404p. (SAND—82-7212/2-App.). NTIS, PC A18/MF A01 - GPO. Order Number DE83016571.

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Appendices are presented concerning systemic event tree analysis; reactor protection system; power conversion system; feedwater-feedwater coolant injection system; and core spray system.

49193 **(NUREG/CR—3214) Summary of Nuclear Regulatory Commission's LOFT Program experiments.** Nalezny, C.L. (EG and G Idaho, Inc., Idaho Falls (USA)). Jul 1983. Contract AC07-76ID01570. 355p. (EGG—2248). NTIS, PC A16/MF A01 - GPO. Order Number DE83016631.

This document is a summary of all the experiments conducted by EG and G Idaho, Inc., for the United States Nuclear Regulatory Commission in the Loss-of-Fluid Test (LOFT) facility. The LOFT facility is a 50-MW(t) pressurized water reactor (PWR) system with instruments that measure and provide data on the system thermal-hydraulic and nuclear core behavior during various types of accident conditions. The operation of the LOFT system is typical of large [~ 1000-MW(e)] commercial PWR operations. The LOFT Experimental Program included 10-mini-blowdown experiments to check out the LOFT system and 30 integral system experiments. The integral system experiments consisted of six experiment groups including nonnuclear large breaks, and nuclear large breaks, small breaks, intermediate breaks, operational transients, and anticipated transients with multiple failures.

49194 **(NUREG/CR—3258) RELAP5 assessment: Semiscale natural-circulation tests S-NC-2 and S-NC-7.** McGlaun, J.M.; Kmetyk, L.N. (Sandia National Labs., Albuquerque, NM (USA)). May 1983. Contract AC04-76DP00789. 97p. (SAND—83-0833). NTIS, PC E05/MF A01 - GPO. Order Number DE83015851.

Includes 1 sheet of 48x reduction microfiche.

The RELAP5 independent assessment project at Sandia National Laboratories in Albuquerque (SNLA) is part of an overall effort funded by the US Nuclear Regulatory Commission (NRC) to determine the ability of various systems codes to predict the detailed thermal/hydraulic response of LWRs during accident and off-normal conditions. This report summarizes the RELAP5 analyses of two particular series of Semiscale natural circulation tests. The RELAP5 models used for the analyses are described. The calculational results for tests S-NC-2 and S-NC-7 are presented. The overall conclusions and their possible relevance to future RELAP5 code application and development are discussed. The appendices provide a brief description of the test facility, and input listings for the transients, for reference.

49195 **(NUREG/CR—3307-Vol.1) Reactor safety research programs. Volume 1. Quarterly report, January-March 1983.** Edler, S.K. (ed.). (Pacific Northwest Lab., Richland, WA (USA)). Jul 1983. Contract AC06-76RL01830. 65p. NTIS, PC A04/MF A01 - GPO $4.50. Order Number DE83016227.

This document summarizes work performed by Pacific Northwest Laboratory from January 1 through March 31, 1983, for the Division of Accident Evaluation and the Division of Engineering Technology, US Nuclear Regulatory Commission. Evaluation of nondestructive examination (NDE) techniques and instrumentation are reported; areas of investigation include demonstrating the feasibility of determining the strength of structural graphite, evaluating the feasibility of detecting and analyzing flaw growth in reactor pressure boundary systems, examining NDE reliability and probabilistic fracture mechanics, and assessing the integrity of pressurized water reactor steam generator tubes where service-induced degradation has been indicated. Experimental data and analytical models are being provided to aid in decision making regarding pipe-to-pipe impacts following postulated breaks in high-energy fluid system piping. Core thermal models are being developed to provide better digital codes to compute the behavior of full-scale reactor systems under postulated accident conditions.

49196 **(NUREG/CR—3329-1) Thermal/hydraulic analysis research program quarterly report, January-March 1983.** (Sandia National Labs., Albuquerque, NM (USA)). Jun 1983. Contract AC04-76DP00789. 77p. (SAND—83-1171). NTIS, PC A05/MF A01 - GPO. Order Number DE83016688.

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The RELAP5 independent assessment project at Sandia National Laboratories is part of a multi-faceted effort sponsored by the NRC to determine the ability of various system codes to predict the detailed thermal-hydraulic response of LWRs during accident and off-normal conditions. The version used for the FY 1982 assessment project was RELAP5/MOD1/CYCLE14. The RELAP5 code is being assessed at SNLA against test data from various integral and separate effects experimental test facilities. The results for Semiscale natural circulation tests S-NC-2 and S-NC-7 show that RELAP5/MOD1 qualitatively describes all modes of natural circulation correctly, but with quantitative disagreement on both the absolute magnitude of the two-phase natural circulation, and on the mass inventories at which various mode transitions occur. The results for LOFT test L5-1/L8-2 show that the primary side response for this set of intermediate break transients is well predicted by both cycle 14 and cycle 18 of MOD1. The B and W steam generator results show that cycle 18 of RELAP5/MOD1 cannot correctly calculate man of the important parameters for steady-state OTSG conditions.

49197 **(NUREG/CR—3355) TRAC-PD2 posttest analysis of the CCTF Evaluation-Model Test C1-19 (Run 38).** Motley, F. (Los Alamos National Lab., NM (USA)). Jul 1983. Contract W-7405-ENG-36. 78p. (LA—9596-MS). NTIS, PC A05/MF A01 - GPO. Order Number DE83016528.

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The results of a Transient Reactor Analysis Code posttest analysis of the Cylindral Core Test Facility Evaluation-Model Test agree very well with the results of the experiment. The good agreement obtained verifies the multidimensional analysis capability of the TRAC code. Because of the steep radial power profile, the importance of using fine noding in the core region was demonstrated (as compared with poorer results obtained from an earlier pretest prediction that used a coarsely noded model).

49198 **(NUREG/CR—3394-Vol.1) Probabilistic assessment of recirculation-sump blockage due to loss-of-coolant accidents: containment-emergency-sump performance USI A-43; executive summary and significant findings. Volume 1.** Wysocki, J.J. (Burns and Roe, Inc., Oradell, NJ (USA)). Jul 1983. Contract AC04-76DP00789. 218p. (SAND—83-7116-Vol.1). NTIS, PC A10/MF A01 - GPO $6.50. Order Number DE83016572.

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The failure of high energy reactor piping systems within the containment building may lead to the destruction of large quantities of insulation. If the resulting insulation debris is transported to the recirculation sump, it can impair the funcitioning of the emergency core cooling system during the recirculation mode. This report presents the results of a probabilistic risk assessment undertaken to estimate the probabilities of break occurrence, the quantities of fibrous debris which might be generated, and the resulting probabilities of sump screen blockage. The results show that sump screen blockage is a function of pipe break probabilites, postulated break locations, pipe diameter, the assumed zone(s) of destruction, and allowable screen blockage head loss.

49199 **(NUREG/CR—3394-Vol.2) Probabilistic assessment of recirculation-sump blockage due to loss-of-coolant accidents: containment-emergency-sump performance USI A-43; compendium of calculated break probabilities, sump-blockage frequencies, and calculational program listing. Vol. 2.** Wysocki, J.J. (Burns and Roe, Inc., Oradell, NJ (USA)). Jul 1983. Contract AC04-76DP00789. 680p. (SAND—83-7116-Vol.2). NTIS, PC A99/MF A01 - GPO $12.00. Order Number DE83016573.

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Appendices are presented concerning determination of initiating event probabilities; blockage frequency determination; probability of sump blockage; and program listings for probabilistic risk assessment of Salem Unit 1.

49200 **(PNL-SA—11134) Parametric calculations of fatigue-crack growth in piping.** Simonen, F.A.; Goodrich, C.W. (Pacific Northwest Lab., Richland, WA (USA)). Jun 1983. Contract AC06-76RL01830. 15p. (CONF-830607—24). NTIS, PC A02/MF A01. Order Number DE83013827.

From American Society of Mechanical Engineers pressure vessel and piping conference; Portland, OR, USA (19 Jun 1983).

This study presents calculations of the growth of piping flaws produced by fatigue. Flaw growth was predicted as a function of the initial flaw size, the level and number of stress cycles, the piping material, and environmental factors. The results indicate that the present flaw acceptance standards of ASME Section XI provide a relatively consistent set of allowable flaw sizes because the predicted life of flawed piping is relatively insensitive to pipe wall thickness, flaw aspect ratio, and piping material (ferritic versus austenitic). On the other hand, the results show that flaws that are acceptable under ASME Section XI can grow at unacceptable rates if the cyclic stresses are at the maximum level permitted by the design rules of ASME Section III. However, a review of the conservatisms inherent to the ASME code rules is presented to explain the low occurrence of piping fatigue failures in service. It is concluded that decreases in the allowable flaw sizes are not justified.

49201 **(RISO-R—424) Experimental and theoretical investigation of inverse annular film flow and dispersed droplet flow, important under LOCA conditions.** Ottosen, P. (Risoe National Lab., Roskilde (Denmark)). Jul 1980. 150p. NTIS (US Sales Only), PC A07/MF A01. Order Number DE83702327.

The flow regimes inverse annular film flow and the change to dispersed droplet flow have been studied through measurements of void fraction and heat flux. Equipment for measuring the mean void fraction by the γ-ray absorption method has been developed. Measurements are presented of the axial void fraction distribution, the low flow inverse film boiling heat transfer, and the heat transfer to the dispersed droplet flow. The experiments were performed in a heated glass tube with a nitrogen gas-liquid two-phase flow at 1 bar. The inlet mass flux was varied through a 10 to 120 kg/m^2s range. Furthermore, a few measurements are presented of void fraction during inside reflood of a single heated steel tube with water. The experimental data from the series of experiments using nitrogen as coolant have been compared with calculations with the one-dimensional, six-equation computer code RISQUE-N2.

49202 **(SAND—83-0447C) Approach to modeling of human performance for purposes of probabilistic risk assessment.** Swain, A.D. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 29p. (CONF-830902—1). NTIS, PC A03/MF A01. Order Number DE83009292.

From NATO human factors meeting on the theory and nature of human error; Bellagio, Italy (5 Sep 1983).

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This paper describes the general approach taken in NUREG/CR-1278 to model human performance in sufficienct detail to permit probabilistic risk assessments of nuclear power plant operations. To show the basis for the more specific models in the above NUREG, a simplified model of the human component in man-machine systems is presented, the role of performance shaping factors is discussed, and special problems in modeling the cognitive aspect of behavior are described.

49203 **(SAND—83-0724C) Response of the Watts Bar, Maine Yankee and Bellefonte containments to static internal pressurization.** Jung, J. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 25p. (CONF-830816—6). NTIS, PC A02/MF A01. Order Number DE83015670.

From International meeting on light-water reactor severe accident evaluation; Cambridge, MA, USA (28 Aug 1983).

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As part of Sandia National Laboratories' Severe Accident Sequence Analysis (SASA) Program, structural analyses of the Watts Bar, Maine Yankee and Bellefonte containment structures were performed with the objective of obtaining realistic estimates of their ultimate static pressure capabilities. The Watts Bar investigation included analyses of the containment shell, equipment hatch, anchorage systems and personnel lock. The ultimate pressure capability is estimated to be between 120 and 140 psig, corresponding to shell yielding and equipment hatch buckling, respectively. The Maine Yankee investigation provided a 96 to 118 psig failure pressure estimate for the containment shell. The pressure capability of the Bellefonte containment structure is estimated to be between 130 and 139 psig corresponding to dome tendon yielding and cylinder wall tendon yielding, respectively.

49204 **(SAND—83-0791C) Role of ex-vessel core retention in severe-accident mitigation.** Fish, J.D. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 8p. (CONF-830816—29). NTIS, PC A02/MF A01. Order Number DE83016240.

From International meeting on light-water reactor severe accident evaluation; Cambridge, MA, USA (28 Aug 1983).

Ex-vessel core retention can reduce the risk of severe nuclear accidents by preventing early, above-ground containment failure for some accident sequences; eliminating the continuous and long-term sources of fission products, aerosols, and combustible gases associated with debris/concrete interactions; and preventing basemat penetration in those reactors, such as a floating nuclear plant, having major liquid pathways for fission product release given such penetration. These effects are discussed and quantified with examples using the CONTAIN code. Finally, an overview of core retention concepts and a summary of recent research is presented. The concepts include particle beds, refractory brick crucibles, and castable ceramic liners.

49205 **(SAND—83-0831C) Crust-formation and refreezing model for molten-fuel/concrete interaction codes.** Cole, R.K. Jr. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 13p. (CONF-830816—14). NTIS, PC A02/MF A01. Order Number DE83016201.

From International meeting on light-water reactor severe accident evaluation; Cambridge, MA, USA (28 Aug 1983).

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There is a class of hypothetical core-melt accidents in nuclear reactors in which molten core materials are deposited into the concrete reactor cavity, resulting in a vigorous thermal attack on the concrete. The temperature of the pool is maintained at a point where heat losses to concrete and to surroundings above the pool approximately balance heat gains from decay of fission products. During the early stages while the pool is fully molten, the dominant heat-transfer process within the pool is convection. At later times, this changes as temperatures fall and refreezing begins. The existing CORCON-MOD1 code, which does not allow these refreezing effects, is being modified to account for the changes in heat-transfer behavior as refreezing takes place.

49206 **(SAND—83-0841C) Thermal-hydraulic process modeling in risk analysis: an assessment of the relevant phenomena.** Weigand, G.G. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 8p. (CONF-830816—12). NTIS, PC A02/MF A01. Order Number DE83016232.

From International meeting on light-water reactor severe accident evaluation; Cambridge, MA, USA (28 Aug 1983).

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An assessment of the thermal-hydraulic processes involved in severe light-water-reactor accidents has been conducted as a task in the MELCOR program. The assessment identifies, reviews, and recommends the systems, structures, and thermal-hydraulic phenomena that need to be included in a risk-assessment code. Moreover, the assessment identifies thermal-hydraulic phenomena where the modeling uncertainties are large or where modeling does not currently exist, thus identifying general thermal-hydraulic, risk-assessment code research needs.

49207 **(SAND—83-0894C) Overview of the MELCOR risk code development program.** Sprung, J.L.; Aldrich, D.C.; Alpert, D.J.; Weigand, G.G.; Cunningham, M.A. (Sandia National Labs., Albuquerque, NM (USA); Nuclear Regulatory Commission, Washington, DC (USA)). 1983. Contract AC04-76DP00789. 9p. (CONF-830816—27). NTIS, PC A02/MF A01. Order Number DE83016507.

From International meeting on light-water reactor severe accident evaluation; Cambridge, MA, USA (28 Aug 1983).

The US Nuclear Regulatory Commission's MELCOR program is developing a new, integrated package of modular risk assessment codes, the MELCOR code system, to replace MARCH, CORRAL/MATADOR, and CRAC. In the development of the MELCOR code system, particular emphasis is being placed on providing capabilities for uncertainty and sensitivity analyses. In the short term, improvements have been made to the MARCH and MATADOR codes to make them more suitable for interim use until the MELCOR code system becomes available. MELCOR program objectives, status, schedule, organization, and results to date are described.

49208 **(SAND—83-1734C) MEDICI reactor cavity model.** Bergeron, K.D.; Trebilcock, W. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 8p. (CONF-830816—13). NTIS, PC A02/MF A01. Order Number DE83016160.

From International meeting on light-water reactor severe accident evaluation; Cambridge, MA, USA (28 Aug 1983).

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The MEDICI reactor cavity model is currently under development with the goal of providing a flexible, relatively realistic treatment of ex-vessel severe accident phenomena suitable for large-system codes like CONTAIN and MELCOR. The code is being developed with an emphasis on top-down design, to facilitate adaptability and multiple applications. A brief description of the overall code structure is provided. One of the key new models is then de-

scribed in more detail. This is a dynamic quench model for debris beds. An example calculation using this model is presented. The question of whether it is necessary to consider the simultaneous motion of the quench front and ablation of the concrete is addressed with some scoping models.

49209 **(SAND—83-1735C) CONTAIN: recent highlights in code testing and validation.** Murata, K.K.; Bergeron, K.D.; Rexroth, P.E.; Clauser, M.J.; Tills, J.L.; Sciacca, F.W.; Senglaub, M.E.; Trebilcock, W.; Williams, D.C. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 11p. (CONF-830816—16). NTIS, PC A02/MF A01. Order Number DE83016300.

From International meeting on light-water reactor severe accident evaluation; Cambridge, MA, USA (28 Aug 1983).

The CONTAIN code is currently being developed for LWR applications. The status of the LWR features and the code testing program will be briefly reviewed. New CONTAIN blind predictions for code validation experiments in the ABCOVE program and the HDR program will be presented, along with CONTAIN comparisons to an NSPP aerosol experiment in a steam environment and to a CSE spray experiment.

49210 **(SAND—83-1737C) Analytic model for predicting dryout and quench behavior in a volumetrically heated particle bed.** Gorham-Bergeron, E. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 10p. (CONF-830816—19). NTIS, PC A02/MF A01. Order Number DE83016241.

From International meeting on light-water reactor severe accident evaluation; Cambridge, MA, USA (28 Aug 1983).

A model which predicts the one-dimensional time-dependent coolant behavior within an internally heated or superheated particle bed is briefly described. The dryout and the quench processes are analyzed in detail, with specific predictions for such quantities as the time for the bed to quench or dry out and the pressure build-up after step changes in power. The importance and implications of using the correct form of the relative permeabilities are discussed. Transient processes predicted to occur during an LWR accident are described.

49211 **(SAND—83-1738C) Remaining uncertainties in predicting the coolability limits of a degraded reactor core.** Gorham-Bergeron, E. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 11p. (CONF-830816—11). NTIS, PC A02/MF A01. Order Number DE83016223.

From International meeting on light-water reactor severe accident evaluation; Cambridge, MA, USA (28 Aug 1983).

The prediction of coolability limits of a degraded core is discussed with special emphasis on the areas of uncertainty. Where possible, the magnitude of the uncertainty is stated or estimated. The importance of using actual reactor debris properties in contrast to those of the spherical ball bearings or glass beads typically used in simulant experiments is stressed. Reviews of uncertainties in existing models and of potentially important, but as yet unexplained, anomalous experimental phenomena are also included. Finally, a listing of current research programs (USNRC, DOE and EPRI sponsored programs as well as foreign or independent programs in this and related areas) is provided with an assessment of probable contributions of these programs toward resolving remaining uncertainties.

49212 **(STUDSVIK-NR—82-113) Analysis of decisions and evaluation of components influencing the state of decisions of nuclear power plant operators. Stage I and II.** Sjoelin, P.G. (Studsvik Energiteknik AB, Nykoeping (Sweden)). 28 Jun 1982. 64p. (In Swedish). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702333.

A proposal for reporting and for feedback of human malfunctions at Swedish nuclear power plants is presented for regular use. The method is intended for the description of terms which are independent of the situation. There is also the possibility to improve the exchange of experience with other countries. The proposed method was tested on a couple of incidents at Swedish nuclear power plants. The simplified version of the decision analysis was found to be sufficient for uncomplicated cases.

49213 **(UCID—19707) Preliminary systems-interaction results from the Digraph Matrix Analysis of the Watts Bar Nuclear Power Plant safety-injection systems.** Sacks, I.J.; Ashmore, B.C.; Champney, J.M.; Alesso, H.P. (Analytic Information Processing, Inc., Danville, CA (USA); Lawrence Livermore National Lab., CA (USA)). Jun 1983. Contract W-7405-ENG-48. 164p. NTIS, PC A08/MF A01. Order Number DE83016640.

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This report provides preliminary results generated by a Digraph Matrix Analysis (DMA) for a Systems Interaction analysis performed on the Safety Injection System of the Tennessee Valley Authority Watts Bar Nuclear Power Plant. An overview of DMA is provided along with a brief description of the computer codes used in DMA.

49214 **(UCRL—86231) Probabilistic culling in fault tree evaluation.** Wells, J.E.; Lappa, D.A. (Lawrence Livermore National Lab., CA (USA)). 9 Nov 1982. Contract W-7405-ENG-48. 4p. (CONF-830106—2). NTIS, PC A02/MF A01. Order Number DE83015843.

From Reliability and maintainability symposium; Orlando, FL, USA (25 Jan 1983).

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This paper defines probabilistic culling, tells why it is needed, describes it, and provides an example of its use. The example shows that the probability of a top event is adequately approximated using only a small proportion of the minimal cut sets contained within the fault trees. Even the best fault tree computer codes running on large computers have not been able to solve some large fault trees, and the cost to solve other large fault trees has been high. We needed a procedure which would reduce the size of the fault trees. The procedure we chose was probabilistic culling. Probabilistic culling discards cut sets that do not contribute significantly to top event probability. Cut sets do not contribute significantly if their probabilities are relatively small. It is not efficient to compute their probabilities in order to cull them, but it is efficient to compute bounds or approximations to their probabilities and cull them if the bounds or approximations on their probabilities satisfy specified conditions.

49215 **Analysis of the hydrogen bubble concerns in the Three-Mile Island Unit-2 Reactor vessel.** Gordon, S.; Schmidt, K.H.; Honekamp, J.R. (Argonne National Lab., IL (USA)). *Radiation Physics and Chemistry;* 21: No. 3, 247-258(1983).

After the accident at the Three-Mile Island Reactor, press reports appeared about a non-condensable bubble in the reactor vessel. Danger of explosion was reported to be imminent. We analyzed all possible sources of non-condensable gases and determined that a continuing growth of the bubble during several days after the accident was not possible. (1) Most of the initial hydrogen in the bubble was produced by the reaction of the Zircaloy cladding with the super-heated water. (2) During the first 16 hr after shutdown, when boiling of the primary coolant water took place, in the worst case stoichiometric amounts of hydrogen and oxygen could have been produced by radiolysis, leading to a maximum amount of oxygen in the bubble, of 0.7% of the hydrogen, which is well below the explosion limit. (3) After this 16 hr period, when boiling had totally ceased, no further oxygen could have been produced by radiolysis of the primary cooling water. On the contrary, oxygen was recombined with hydrogen due to radiolysis at such a rate that the oxygen in the water was completely removed in less than five minutes. The subsequent rate of removal of oxygen from the bubble by dissolution and radiolysis depended essentially on the rate of dissolution.

49216 **Incidents in West German nuclear power plants in 1981.** Bonn, Germany; Bundesministerium des Innern (1982). 29p. (In German). Pressedienst of Bundesministerium des Innern, Bonn, Germany.

Five of the 152 incidents recorded in 1981 had already occurred in 1980. 45 events were attributed to category B, and 107 to category C. 110 incidents occurred in power operation, 8 during start-up and shutdown, and 34 in the shut down state. 78 had no

effects on operation. 8 led to reduction of power, 9 to shutdown and 23 to fast shutdown. 12 of the latter occurred in power reactors, 11 in pilot reactors. 97 occurred spontaneously, 55 during testing, maintenance and servicing. 77 of the 97 spontaneous incidents occurred in power operation, 5 during start-up and shutdown and 15 in shutdown state. 76 events (50%) were due to failure of component and component parts, 31 to operation, maintenance, repair and assembly, 17 to design, 14 to manufacture and fabrication, 4 to operating methods and operating conditions, and 10 to other and obscure reasons. By order of systems, 43 incidents occurred in reactor accessory- and auxiliary facilities, 14 in the reactor safety system, 33 in the stand-by system, 15 in the water and steam cycle, 10 while handling fuel elements, and 7 in the turbo set. (orig./HP).

25 ENERGY STORAGE

2502 Compressed Gas

49217 **(PNL-SA—11559) Porous media reservoir stability criteria for compressed-air energy storage.** Allen, R.D. (Pacific Northwest Lab., Richland, WA (USA)). Jul 1983. Contract AC06-76RL01830. 8p. (CONF-830974—1). NTIS, PC A02/MF A01. Order Number DE83016797.

From Physical and chemical energy storage annual contractor's review meeting; Arlington, VA, USA (12 Sep 1983).

A dome-shaped sandstone aquifer conformably overlain by an impervious shale, dolomite or limestone caprock is the desired geology for a porous rock compressed air energy storage (CAES) reservoir. At least one additional overlying caprock formation is preferred. Regional ground-water flow gradients should be insufficient to significantly distort or displace the air bubble within the aquifer. The ranges of parameters for a full-scale system include: reservoir depth - 200 to 1500 m; formation thickness and closure - 10 m or more each; primary caprock thickness - 6 to 10 m or more; reservoir radius - ca 1000 m; reservoir volume - ca 15 x 10^6 m^3; reservoir porosity - 10% minimum; reservoir permeability - 300 md minimum; maximum charging pressure - 18.1 kPa/m of depth; maximum injection temperature - 200°C; storage pressure (water discovery pressure) - 2.0 to 15.0 MPa; and air withdrawal mass fraction - 10%. Water coning must not inhibit air withdrawal. Injection pressure must not exceed 50% of the caprock threshold pressure. Reservoir lithology and stability are discussed.

2506 Thermal

49218 **(PB—83-200311) De afvlakking van temperatuurvariaties in het grondwater door warmte uitwisseling tussen het watervoerende pakket en de boven- en ondergelegen pakketten (Dampening of fluctuations in groundwater temperature by heat exchange between the aquifer and the adjacent layers).** Uffink, G.J.M. (Rijksinstituut voor Drinkwatervoorziening, The Hague (Netherlands)). 1981. 48p. NTIS, PC E04/MF E01.

Heat storage in aquifers is very attractive from the point of view of energy conservation. However, the influence on the chemical and microbiological composition of groundwater is insufficiently known. The nature and the extent of this influence can best be studied in the field. An understanding of the transport of heat in the aquifer will be indispensable in case of field measurements. For this purpose several aspects of non-steady and periodic heat transport are discussed, with special attention to the heat exchange between the aquifer and adjacent layers.

2509 Batteries

REFER ALSO TO CITATION(S) 49460

49219 **(AD-P—000960/5) Lithium-thionyl chloride batteries - past, present and future.** McCartney, J.F.; Lund, T.J.; Sturgeon, W.J. (Naval Ocean Systems Center, San Diego, CA (USA)). Feb 1980. 13p. NTIS, PC A02/MF A01.

Lithium based batteries have the highest theoretical energy density of known battery types. Of the lithium batteries, the lithium-thionyl chloride electrochemistry has the highest energy density of those which have been reduced to practice. The characteristics, development status, and performance of lithium-thionyl chloride batteries are treated in this paper. Safety aspects of lithium-thionyl chloride batteries are discussed along with impressive results of hazard/safety tests of these batteries. An orderly development plan of a minimum family of standard cells to avoid a proliferation of battery sizes and discharge rates is presented.

49220 **(BMFT-FB-T—83-095) High temperature - high energy cell with a solid electrolyte.** von Alpen, U.; Bell, M.F.; Hoefer, H.H.; Schindler, S. (Bundesministerium fuer Forschung und Technologie, Bonn (Germany, F.R.)). May 1983. 39p. (In German). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83751100.

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In the phase diagram with the end compounds Na_2O, ZrO_2, SiO_2, P_2O_5, a new compound Nasub(2.94)Zrsub(1.49)Sisub(2.2)Psub(0.8)Osub(10.53) has been found. This material has many advantages when used as a ceramic separator in Na/S cells, i.e. it can be easily synthesized from the starting materials, it has a low sintering temperature, it is insensitive towards moisture and it has a low resistance of rho=7.5 Ω cm at the working temperature of the Na/S cell and it is stable in contact with molten sodium up to a temperature of 400°C. In addition another composition Nasub(3.1)Zrsub(1.55)Sisub(2.3)Psub(0.7)O_{11} has been found which may be well suited for room temperature application because of its high conductivity. The low sintering temperature of these compounds enables the application of ceramic plastification procedures for the fabrication of ceramic parts of any shape.

49221 **(CONF-821211—Suppl.) Electrochemical-Storage-Systems Program summary.** Kwan, Q. (comp.). (Aerospace Corp., Washington, DC (USA)). Dec 1982. Contract AI01-79ET25204. 308p. NTIS, PC A14/MF A01. Order Number DE83011254.

From 5. DOE battery and electrochemical contractors' conference; Crystal City, VA, USA (7 Dec 1982).

A brief description of each contract and subcontract that was a part of the Electrochemical Energy Storage System (ECS) program through FY 1982 is provided. The work described covers electrochemical systems research, supporting research, electrochemical processes, and fuel cells for transportation, aqueous non-flow batteries, nonaqueous batteries, and battery testing. (LEW)

49222 **(DOE/OR/90300—T1) Separators for lithium alloy-iron sulfide fused-salt batteries. Final report.** Walker, R.D. Jr. (Florida Univ., Gainesville (USA). Engineering and Industrial Experiment Station). 15 Jun 1983. Contract AS05-76OR90300. 14p. NTIS, PC A02/MF A01. Order Number DE83016203.

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The principal objective of this work was to make a continuous sheet of chemically resistant materials having the desired physical properties. Regrettably, this objective was not achieved owing primarily to the basic characteristics of the principal material, boron nitride fibers. The report summarizes the work undertaken with the paper machine itself and with the various stages of the papermaking process. Several suggestions of alternative techniques and different approaches are included.

49223 (LBL—15295, pp 1.43-1.48) **Technology base research project for electrochemical energy storage.** Cairns, E.J.; McLarnon, F.R. Jun 1983. NTIS, PC A04/MF A01. Contract AC03-76SF00098.

In Energy & Environment Division annual report. Chemical process research and development program, FY 1982.

The Lawrence Berkeley Laboratory (LBL) is lead center for management of the Technology Base Research (TBR) Project. During FY 1982, this project consolidated the research activities of several smaller programs in the electrochemical branch of DOE's Energy Storage Division. The general aim of the TBR Project is to provide an applied research base supporting the development of batteries and electrochemical systems that exhibit superior performance and acceptable life-cycle costs. The intended applications include electric vehicles and stationary energy storage and conver-

sion. A major goal is to identify electrochemical technologies having the greatest potential to satisfy performance and economic requirements and transfer them to DOE's Exploratory Technology Development and Testing project and/or private industry for further development and scale-up. The TBR Project includes four major elements: electrochemical systems, supporting research, electrochemical processes, and fuel cell research. (Fuel cell research is managed by the Los Alamos National Laboratory.) Progress is reviewed. (WHK)

49224 **(LBL—16511) Anodic films.** Muller, R.H. (Lawrence Berkeley Lab., CA (USA)). Aug 1983. Contract AC03-76SF00098. 10p. (CONF-830859—4). NTIS, PC A02/MF A01. Order Number DE83016603.

From National meeting of the American Institute of Chemical Engineers; Denver, CO, USA (28 Aug 1983).

Surface layers are formed on many metals by anodic reaction. Such layers include the products of charge and discharge in many storage batteries, dielectric films used in electronic and optical circuits and display devices, layers responsible for passivity and corrosion protection, and films generated in metal shaping and finishing operations such as anodization, coloring, electropolishing, electrochemical machining and deburring. Anodic films are formed by solid-solid transformations or by dissolution-precipitation processes. Film properties and mechanisms of formation can be determined in situ by a number of optical techniques which have recently become available.

49225 **(SAND—83-1655A) Membranes and separators for flowing-electrolyte batteries: a review.** Arnold, C. Jr.; Assink, R.A. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 28p. (CONF-830859—3). NTIS, PC A03/MF A01. Order Number DE83016246.

From National meeting of the American Institute of Chemical Engineers; Denver, CO, USA (28 Aug 1983).

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Membranes and separators for flowing electrolyte batteries are reviewed. Simple descriptive models are used to illustrate their functions and to distinguish between the operation of separators and membranes. Several studies which investigated the relationships between membrane structure and properties are reviewed. The many methods of separator and membrane preparation are compared. Finally, the specific separator and membrane requirements of three flowing electrolyte battery systems currently under development are described. Emphasis is placed on the mechanism of membrane fouling in iron/chromium redox battery, oxidative degradation of the membrane in the zinc/ferricyanide battery and separator impurities in the zinc/bromine battery.

49226 **Development of an ultrasonic technique to measure specfic gravity in lead-acid battery electrolyte.** Swoboda, C.A.; Cannon, P.H.; Fredrickson, D.R.; Gabelnick, S.D.; Hornstra, F.; Phan, K.A.; Singleterry; Yao, N.P. (Fermilab, P.O. Box 500 CL 14, Batavia, IL 60510). *IEEE (Institute of Electrical and Electronics Engineers) Transactions on Sonics and Ultrasonics;* 30: No. 2, 69-77(Mar 1983). (In Russian).

An ultrasonic technique to measure specific gravity in lead-acid battery electrolyte is described in detail. This technique, which is based on the theory that the velocity of sound in a liquid depends on the density of the liquid, compares the ultrasonically measured velocity of sound in battery electrolyte (derived by measuring the time required for sound to traverse a known distance of electrolyte) to velocities in a computer-stored data base relating velocity, density, and temperature. The experimental design, the data base developed for the method, a laboratory feasibility study, and an error analysis of the study are discussed. The major advantages of the method are 1) the passive nature of the measurement, 2) the continuous sample and display capabilities, 3) the instantaneous tracking of changes in specific gravity, and 4) inherent averaging of the specific gravity measurements.

29 ENERGY PLANNING AND POLICY

2901 Energy Analysis And Modeling

REFER ALSO TO CITATION(S) 48551, 48573, 48574, 48603, 48604, 48655, 49273, 49274

49227 **(BNL—33229) Simulation aspects of normative models in energy planning.** Hill, D. (Brookhaven National Lab., Upton, NY (USA)). 1983. Contract AC02-76CH00016. 14p. (CONF-8305114—1). NTIS, PC A02/MF A01. Order Number DE83014235.

From Riso international conference on the use of simulation models in energy planning; Riso, Denmark (9 May 1983).

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A fundamental distinction can be drawn between simulation models that are descriptive and normative models that are prescriptive. Simulation models, which are often used for forecasting, are characteristically studied by observing their behavior over time. To some extent, normative models such as dynamic linear programs can be used in the same way in energy planning. An example is their application to industrial processes where the behavior of firms in an industry may be viewed as a resource-allocation process. Where sensitivity tests indicate similar results over a wide range of variation in input assumptions, it is difficult not to infer that these conclusions have predictive value. Coupling an econometric model with a linear program may cause it to behave more like a simulation. Institutional pressures to make models multipurpose may go too far, however; multiobjective programming which tries to simulate the decision maker blurs the ability to infer the consequences of different objectives. Ultimately, normative models will be predictive to the extent that their lessons are learned.

49228 **(EFN-AES—1983-1(Pt.1)) Energy decisions. Pt.1: Synthesis. A collation of knowledge based on research as a basis for decisions on energy systems.** Karlsson, C.; Hakkarainen, E.; Larsson, P. (Energiforskningsnaemnden, Stockholm (Sweden)). 1983. 180p. (In Swedish). NTIS (US Sales Only), PC A09/MF A01. Order Number DE83750986.

The report is based upon an analytical model which functions as a generator of the directions of energy policy. The five topics which are discussed are the following: alternative introduction of peat, building standards and solar energy. The facts and particulars have been presented in part II of the report.

49229 **(EFN-AES—1983-1(Pt.2)) Energy decisions. Pt. 2: Analysis and appendices. A collation of knowledge based on research as a basis for decisions on energy systems.** Karlsson, C.; Hakkarainen, E.; Larsson, P. (Energiforskningsnaemnden, Stockholm (Sweden)). 1983. 453p. (In Swedish). NTIS (US Sales Only), PC A20/MF A01. Order Number DE83750987.

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This part of the report includes the facts and the analysis of various energy systems, such as production systems, conversion systems and distribution systems. In addition to that the economy, organisation, the structure and human resources, and their efficiency is discussed. The political, social, physical and economical environment is touched upon and the raw materials and their market effects are presented. The object of the national energy policy is reviewed.

49230 (NUREG/CP—0042, pp 71-86) **Further developments in end-use modeling.** Hamblin, D.M. (Oak Ridge National Lab., TN). Jul 1983. NTIS, PC A07/MF A01 - GPO. (ORNL/TM—8692; CONF-820284—).

From Workshop on forecasting electricity demand by state agencies; Washington, DC, USA (23 Feb 1982).

Oak Ridge National Laboratory's (ORNL) building sector end-use models for major components: building stock growth, usage, technology assessment, and a basic econometric one which deals with fuel and equipment choice. Factors which have motivated improvements in their models include a need for a change in the territory for the analysis and failures in the models to provide reli-

able forecasts. Based on some professional constructive criticism, the improvements made in the ORNL models are discussed.

49231 **(UCID—19227-82) US energy flow, 1982.** Briggs, C.K.; Borg, I.Y. (Lawrence Livermore National Lab., CA (USA)). 29 Jul 1983. Contract W-7405-ENG-48. 17p. NTIS, PC A02/MF A01. Order Number DE83016532.

A flow diagram for 1982 describing the US energy situation is consistent with past conventions. The 70 quads (70 x 10^{15} Btu) of energy consumed is down from 73 quads in 1981 and 75 quads in 1980. The trend reflects a prolonged recession and price driven conservation reflecting the increase in international crude oil prices. Although oil continues to dominate the energy picture by comprising 42% of all energy input, its use continued to decline in 1982. Principal petroleum product reflecting the decline in use is residual oil. Motor gasoline use declined only slightly despite improved fleet mileages. Crude-oil imports absorbed the decline in oil use. Mexico took over as the US's prime supplier with Saudi Arabia as number two. Coal conversions principally for electric-power generation stabilized during 1982 probably because associated capital costs to retrofit oil and gas facilities proved onerous. As a consequence, coal use in the US in 1982 was close to that of 1981. Natural gas use fell largely due to curtailed activity within the industrial sector. Nonetheless, the ratio between energy consumption and GNP as measured in constant dollars fell again. Electric-power generation fell several percent, the first decrese since World War II. Nuclear power provided 12.6% of electrical power with 60 GW/sub e/ available capacity. Coal provided 53%.

2902 Economics And Sociology

REFER ALSO TO CITATION(S) 48601, 49239, 49240, 49264, 49272, 49287, 49902, 49907, 49911, 50075, 50083

49232 **(INIS-mf—7982) MSGE. Energy in a multi-sector growth model for Denmark. Supplement to the report "Danish economy and the energy problems".** (Oekonomiske Raad, Copenhagen (Denmark). Formandskabet). Jun 1980. 52p. (In Danish). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83780770.

The basic model for calculations of far-stretched socio-economic consequences of the growing energy costs is presented in this supplement to the survey report "Danish economy and the Energy problems". The MSGE model is a modernized version of "A multi-sectoral study of economic growth adjusted to Danish conditions and corresponding to the newer Norwegian and Swedish MSGE models. (E.G.).

49233 **(NP—3750983) Nordenergi 2020. Some viewpoints of Scandinavian electric cooperation with glances at the rest of the energy sector.** Loef, A. (Nordel Planning Committee). Oct 1982. 57p. (In Swedish). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83750983.

Summary in English.

The study deals with electric energy, Nordel's normal area of activities. Other forms of energy are discussed because of the interchangeability between them. No predictions about the future utilization of new types of energy have been made. The Nordel duties are summarized: - to interchange experience on the generation distribution and use of electric energy. - to make recommendations on the joint utilization of resources and on the expansion of interconnections. - to draw up design criteria for generation and transmission facilities. The economic benefit of this cooperation is in the order of several hundred million SEK a year. The study shows that the Nordic countries could be 100% self-sufficient with energy the year 2020, whereas the present energy balance from the standpoint of raw energy materials will show only 30% self-sufficiency. It is apparent that a deeper R and D cooperation would be advantageous. The study presents electric energy balances from 1980 to 2020. Introduction of nuclear power in Denmark, its continued expansion in Finland and the abolishment of Swedish nuclear power generation have been assumed. A common planning of all the Nordic countries would result in considerable cost savings. An interesting joint project is the expansion of Norwegian hydro-electric power for peak power supplies. The construction of more hydroelectric power plants in Norway and Sweden could give important economic advantages.

49234 **(PB—83-180125) Economic analysis of fishing industry energy conservation technology.** Swartz, A.N. (National Marine Fisheries Service, Seattle, WA (USA)). Jan 1983. 32p. NTIS, PC A03/MF A01.

This paper is intended to familiarize the reader with life-cycle analysis and to demonstrate the application of these tools on a representative fishing vessel.

49235 **(PB—83-181883) Financing America's unemployment compensation program. Technical staff paper 4.** Diefenbach, D.L. (Employment and Training Administration, Washington, DC (USA). Unemployment Insurance Service). 1979. 104p. NTIS, PC A06/MF A01.

The purpose of this study is to review the benefit financing problem in the American unemployment insurance system, to identify major taxation issues, to enumerate policy options and to offer specific recommendations appropriate to the times and to the American traditions in financing this social insurance program. The study is intended to assist program analysts and policymakers in evaluating taxation policy issues and developing reform legislation.

49236 **(PNL-SA—11391) MASTER: a forecast model of reginal economic activity.** Moe, R.J.; Adams, R.C.; Scott, M.J. (Pacific Northwest Lab., Richland, WA (USA)). Jun 1983. Contract AC06-76RL01830. 21p. (CONF-830696—2). NTIS, PC A02/MF A01. Order Number DE83016208.

From ORSA-TIMS conference; Washington, DC, USA (7 Jun 1983).

The Metropolitan and State Economic Regions (MASTER) model is presented. This model was constructed by researchers at Pacific Northwest Laboratory in response to the need for a national multiregion model of economic activity in substate areas which can be used for forecasting, planning, and policymaking in energy-related fields. MASTER forecasts economic activity in all 268 Standard Metropolitan Statistical Areas (SMSAs) and 48 non-SMSA Rest-of-State-Areas (ROSAs) in the continental United States. Employment in each of twelve sectors is determined in part by local electricity and natural gas prices. Local construction prices, which are also under the influence of energy policymakers via building energy-efficiency standards, determine construction activity and hence economic activity. Disaggregation in the industrial employment and construction blocks of the model is fine enough for the model to drive the Oak Ridge Energy Demand Models and other demand models. The remainder of the paper describes the MASTER model, discusses potential applications, and assesses impacts of three hypothetical energy-related events in each of nine SMSAs.

49237 **(PNL-SA—11430) Regional impacts of increasing energy prices.** Moe, R.J.; Adams, R.C.; Scott, M.J. (Pacific Northwest Lab., Richland, WA (USA)). Jul 1983. Contract AC06-76RL01830. 39p. (CONF-830773—1). NTIS, PC A03/MF A01. Order Number DE83016209.

From 58. Western Economic Association annual conference; Seattle, WA, USA (20 Jul 1983).

This paper presents the Metropolitan and State Economic Regions (MASTER) model. MASTER forecasts annual economic activity in all 268 Standard Metropolitan Statistical Areas (SMSAs) and 48 non-SMSA Rest-of-State Areas (ROSAs) in the continental United States. Among other variables, MASTER forecasts employment in twelve industrial sectors; employment in each sector is determined by the levels of and annual changes in real electricity and natural gas prices and other factors. Thus, the model is capable of assessing the effects of energy price changes on local economic activity. The remainder of the paper is divided into four sections. In the first, the model is described. Model structure, equation specification, data sources, equation estimation, and model simulation are discussed. MASTER's predictive capabilities are evaluated in the second section. Theil backcast statistics are presented for each of eight US cities. In the third section, the impacts of five different energy-price scenarios on economic activity in each of the eight cities is assessed. Conclusions are discussed in the final section.

49238 Net effects of government intervention in energy markets. Dickens, P.F. III (USDOE Energy Information Administration, Washington, DC); McNicol, D.L.; Murphy, F.H.; Zalkind, J.H. *Energy Journal;* 4: No. 2, 135-149(Apr 1983).

The energy programs considered herein have little impact on energy supply, consumption, prices, and oil imports. The broad similarity between the current programs case and the less-intervention case (current programs modified) is largely explained by (1) the intended effects of some programs that will be more pronounced in later decades, (2) higher energy prices that work in the same direction as many energy programs and hence tend to reduce the impacts of these programs, and (3) the effects of the energy programs that offset one another. The conclusions do not imply that energy programs are inconsequential. Many of the recent programs were initiated to counterbalance the effect of programs right after the 1973-1974 soil embargo when policy was to alleviate the pain of higher prices. Shifting directions and imposing this panoply of programs has not been without cost in terms of resources required to operate programs, the economic distortions associated with the programs, and the political energy involved. 8 references, 1 figure, 4 tables.

2903 Environment, Health, And Safety

REFER ALSO TO CITATION(S) 48606, 49158, 49161, 49163, 49165, 49166, 49822, 49829, 49830, 49832, 49834, 49849, 49853, 49854, 49867, 49901, 49904, 49908, 49909, 49910, 50034, 50067, 50074, 50084

49239 (PB—83-149468) Effect of the state laws and economic factors on exhaustion rates for regular unemployment benefits: a statistical model. Nicholson, W.; Corson, W. (Mathematica Policy Research, Princeton, NJ (USA); Employment and Training Administration, Washington, DC (USA). Unemployment Insurance Service). 1978. 140p. NTIS, PC A07/MF A01.

The report presents a statistical model of the effects of state laws and economic factors on exhaustion rate for regular unemployment insurance benefits. The model was estimated from quarterly pooled time-series, cross-sectional data for all states over the period 1965 to 1974. Exhaustion rate was found to be positively correlated with insured unemployment rate. A cyclical one percentage point increase in the IUR was calculated to result in a 4 to 5 percentage point increase in the exhaustion rate. The effect was offset somewhat by the tendency of average potential duration to rise during the cyclical downturns. Higher average potential unemployment durations tended to reduce exhaustion rates. Wage-replacement rates on unemployment tended to have a positive effect on exhaustion rate.

49240 (PB—83-193615) Costs of particulate matter controls for nonfossil fuel fired boilers. Final report. Barnett, K.W.; Kwapil, W.D.; Margerum, S.C. (Radian Corp., Durham, NC (USA); Environmental Protection Agency, Research Triangle Park, NC (USA). Emission Standards and Engineering Div.). Feb 1983. 122p. NTIS, PC A06/MF A01.

This report is a resource document for the development of Federal standards of performance for control of particulate matter from new nonfossil fuel-fired boilers ranging in size from 30 to 400 million Btu/hour heat input. Capital and annualized costs for a variety of alternative emission control systems are given for wood, bark, solid waste (refuse), and bagasse fired boilers.

49241 Risks in socio-cultural perspective. Kwee, S.L. (Technische Hogeschool Eindhoven (Netherlands)). pp vp of Radiation hygiene and society: a risk in perspective. Eindhoven (Netherlands); Nederlandse Vereniging voor Stralingshygiene (1981). (In Dutch)

An exposition is presented of the principles of a socio-cultural risk theory based on the statement 'Risk is structured uncertainty'. It deals with hazards of human behaviour, risk as a challenge, hazards in nature and in culture, in science and enterprise, to close with a few words on today's crisis and uncertainty. .

49242 Radiation hygiene and governmental aspects. Braams, R. (Rijksuniversiteit Utrecht (Netherlands)). pp vp of Radiation hygiene and society: a risk in perspective. Eindhoven (Netherlands); Nederlandse Vereniging voor Stralingshygiene (1981). (In Dutch)

An important factor in the discussion on nuclear power generation is the amount of information and the way the information is given to the public as well as the way this public understands and accepts the data. The government - of the Netherlands in this case - has two important tasks, viz. 1) to produce and improve safety standards for radiation protection and see that the regulations are followed and correctly executed; 2) to present clear information and extensive elucidation of this information to the public in order to also prevent unnecessary anxieties or psychological damage apart from somatic damages. A good estimation of the information need of the public is essential.

2904 Natural Resources

49243 (PB—83-175331) Analysis of irrigation pumping and application efficiency in the central Ogallala formation. Mapp, H.P. Jr. (Oklahoma Water Resources Research Inst., Stillwater (USA); Office of Water Research and Technology, Washington, DC (USA)). Jan 1983. 114p. NTIS, PC A06/MF A01.

This study evaluates irrigation technologies designed to increase pumping and application efficiency for irrigated grain sorghum in the Oklahoma Panhandle region. A dynamic grain sorghum plant growth model is incorporated into a farm level simulation model to derive the effects of alternative irrigation schedules on crop yields, water use and producer net returns. Comparisons of proposed irrigation schedules is accomplished using stochastic efficiency and optimal control procedures.

49244 (PB—83-213983) Minerals yearbook centennial edition 1981. Volume 3. Area reports: international. (Bureau of Mines, Washington, DC (USA)). Apr 1983. 1380p. (BM-MYB—1981-V0L-3). NTIS, PC A99/MF E10.

This edition of the Minerals Yearbook marks the centennial of the first annual publication of comprehensive mineral industry statistics by the Federal Government. This volume of the Minerals Yearbook contains the latest available mineral data on more than 130 foreign countries and discusses the importance of minerals in the economies of these nations. A separate chapter reviews the international minerals industry in general and its relationship to the world economy.

2905 Research, Development, Demonstration, And Commercialization

REFER ALSO TO CITATION(S) 49267, 49332

49245 (DFE—55-1) Energy research program 1978/79-1980/81. Survey of activities. General investigations and analysis. Summary of branch reviews. Josefsson, T. (Delegationen foer Energiforskning, Stockholm (Sweden)). Jun 1982. 161p. (In Swedish). NTIS (US Sales Only), PC A08/MF A01. Order Number DE83750976.

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The aim of the evaluation of the period 1978 to 1981 is to scrutinize the developmental process and the concentration of of this type of program are analysed. The economy and special areas such as peat, pulp and advanced techniques have received particular attention. The coordinated energy research activities have made use of 800 MSEK. The analysis of systems is considered as a suitable instrument when investigating energy systems. The motives of government subsidies to research, development and demonstration projects are discussed. The uncertain profitability of new techniques implies many problems. The governmental planning of energy policy is said to require further information support in a concentrated form. There is a need to specify the objects of the national energy research in detail. The various parts of the research programs and their evaluation are treated in appendices. Finally,

the report presents a number of recommendations concerning long-term research programs.

49246 (DFE—55-2) Energy research program. Survey of activities. General investigations and analysis. Summary of branch reviews. Josefsson, T. (Delegationen foer Energiforskning, Stockholm (Sweden)). Jun 1982. 80p. (In Swedish). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83750977.

Portions are illegible in microfiche products.

The report presents the summaries of five separate evaluations covering different energy research fields. Economical figures foir the years 1978 through 1981 are included. The research fields are as follows: environment, cellulose, peat, advanced techniques, solar heat. The referred reports have been issued separately. International cooperation is discussed.

49247 (DFE—56) Energy research program 1978/79-1980/81. The treatment of environmental problems. Arnberg, E.; Steen, B. (Delegationen foer Energiforskning, Stockholm (Sweden)). Mar 1982. 74p. (In Swedish). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83750978.

This report presents an evaluation of the reviews covering the environmental problems inside the energy research program. Both the effects on supply and the use of energy are considered. The following separate items of energy production are discussed: biomass, peat, synthetic fuels, gasification, liquefaction, coal, hot water technique, geothermal and wind energy. The use of energy is divided into industrial processes, transport and buildings. It is concluded that it has been difficult to compare the plans and the subsequent activities and that the activities are distributed among many organisations.

49248 (DFE—57) Place of energy research programs in the different parts of the developmental process. Case stories. (Delegationen foer Energiforskning, Stockholm (Sweden)). Aug 1982. 74p. (In Swedish). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83750979.

Twelve different projects of the Swedish energy research program have been evaluated. The result is presented in the form of case stories. - Carbogel is a dispersion of coal and water. The time and the resources which were necessary to make the product commercially interesting were underestimated. - Energy conserving houses are buildings which make use of solar heat. It was found that their construction should be as simple as possible. - Hedstrom dryer makes use of superheated steam and saves 25% of energy. The development has taken 20 years. - Nydo Energi is a company, the task of which is to handle and s-distribute domestic fuels. - Pellets are compressed substances to be used as fuel. Their production is considered as potential municipal investment. - Solar drying of corn and hay has been a successful agricultural project. - Cutting stones defibration for pulp production. - Velling is a geothermal district heating plant and its economy. - Heat pumps is an evaluation of commercial itmes from three different manufacturers.

49249 (DFE—60) Energy research program 1978/79-1980/81. Surveying the performance of the line of advanced energy technology etc. Blomqvist, G. (Delegationen foer Energiforskning, Stockholm (Sweden)). May 1982. 69p. (In Swedish). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83750982.

The areas which have been investigated were solar energy, aquatic energy, advanced technique and part of geothermal energy. The judgment is based upon progress reports and personal communications. The aim of this study is to find out how much has been achieved of what was originally planned. It is questioned why the developmental and applied work with solar cells has not been started whereas the work with aquatic energy has implied increased competence. Concerning advanced technique, the special areas of fuel cells and thermionic conversion have recieved satisfactory treatment. the plans covering MHD power generation and geothermal projects have not been fulfilled.

49250 (DOE/MA—0008/9) Department of Energy Audit Report Tracking System (DARTS). Quarterly management report as of June 30, 1983. (USDOE Assistant Secretary for Management and Administration, Washington, DC. Office of the Controller). Aug 1983. 82p. NTIS, PC A05/MF A01. Order Number DE83016701.

Information is provided to DOE management on the status of corrective actions on audit recommendations contained in reports on audits of DOE activities, programs and contracts. It is based on data accumulated in accordance with DOE Order 2300.1 which established a DOE Audit Report Tracking System (DARTS). The Order provides for bringing to the attention of the DOE Audit Review Council (DARC) such matters as corrective action inordinately delayed, unresolved disagreements between the auditor and auditee, and controversial matters for action deemed appropriate. Table ES-1 summarizes the DARTS activity for the third quarter of fiscal year 1983. The statistics presented on GAO and Headquarters IG issued audit reports pertain to those processed by DOE Headquarters offices. Two such IG reports for which field offices had prime responsibility for audit followup activity are included in the field office statistics.

49251 (ECN—123) List of research reports with report numbers from RCN-1 to RCN-249 published by RCN between 1960 and 1976. de Graaf, C. (Stichting Energieonderzoek Centrum Nederland, Petten). Nov 1982. 63p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702351.

The Stichting Reactor Centrum Nederland (RCN) was founded on 6 July 1955.On 20 July 1976, the name was changed to Netherlands Energy Research Foundation ECN. Before, research reports were published with the report code RCN-. After, a new series of reports was started commencing with report number ECN-1. This list constitutes all research reports with report code RCN- published between 1960 and 1976. In addition to the compilation of bibliographic descriptions, an author list and a KWOC list on all significant words in the report titles have been given.

49252 (RISO-M—2362) Contribution of Risoe National Laboratory to the research development programs of the Danish Ministry of Energy. Status per September 1982. (Risoe National Lab., Roskilde (Denmark)). Dec 1982. 37p. (In Danish). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702353.

Since 1978 Risoe has been responsible for a number of projects in the research and development programs of the Danish Ministry of Energy. This report gives criteria for choice of projects with special emphasis on viewing the projects in connection with other activities at Risoe. All current projects are described individually stating status and results obtained. Risoe's contribution to the organization and the administration of the programs is mentioned. The discussion of criteria and project evaluation leads to identification of some key areas in which Risoe in the future should contribute to the energy research and development programs.

49253 (Y/CP—17) Computer-integrated manufacturing (CIM) - turning visions to reality. Haeusler, K.R. (Oak Ridge Y-12 Plant, TN (USA)). 1983. Contract W-7405-ENG-26. 26p. (CONF-8310131—1). NTIS, PC A03/MF A01. Order Number DE83015481.

From American Society for Engineering Management annual meeting; Washington, DC, USA (17 Oct 1983).

This paper describes methods used to gain management awareness and support for a seven-year, $70 million capital investment program; the development and scoping of requirements for the envisioned systems; obstacles to be overcome in implementing the technology; techniques used to gain general acceptance and involvement; financial planning; the current status of the program; and an assessment of the prospects for final success.

2906 Nuclear Energy

REFER ALSO TO CITATION(S) 48647, 48655, 48656, 48659, 48744, 48956, 49007, 49044, 49047, 49158, 49159, 49161, 49163, 49165, 49166, 49838, 49849, 49902, 49904, 50034, 50075

49254 (AD-A—125683/3) Freeze: the literature of the nuclear weapons debate. deLeon, P. (RAND Corp., Santa Monica, CA (USA)). Sep 1982. 14p. NTIS, PC A02/MF A01.

This report deals with the author's views on debates and examines same of the literature which has, by and large, informed the anti-nuclear movement and inquires as to the intelligence of the debate.

49255 (INIS-mf—8010) International cooperation for establishment and use of nuclear energy in developing countries. Wiendieck, K. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1982. 10p. (CONF-821039—32). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780771.

From IAEA international symposium on nuclear power plant control and instrumentation; Munich, F.R. Germany (11 Oct 1982).

Possibilities of nuclear technology transfer in view of the establishment of nuclear energy systems in developing countries are discussed on the basis of two examples: (I) The theoretical approach (not yet applied) to systemize the decision process and (II) the practical approach exemplified in the case of Brazil. (orig.).

49256 (INIS-mf—8142) Comparison of costs of electricity generation based on nuclear energy and pit coal. Study of the Energiewirtschaftliches Inst., Koeln Univ. - update. (Bundesministerium fuer Wirtschaft, Bonn (Germany, F.R.)). Oct 1981. vp. (In German). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702817.

Despite of a meanwhile considerable increase in costs of installation, especially of nuclear power stations, the differences in costs have increased in favour of nuclear electricity generation. The cost advantages are estimated 4 German Pfennig per kilowatt-hour in the base-load field for plants coming into operation at the end of this decade compared with the most profitable variant of pit coal utilization on which this investigation is based; compared to the use of German hard coal, assuming a relatively optimistic development of prices for domestic hard coal in the future, the cost advantage is estimated 8 German Pfennig per kilowatt-hour. The main reason is that in the past years the price for German hard coal as well as for imported coal considerably rose and for the future further increases have to be expected whereas the largest share of the costs of nuclear electricity generation doesn't increase, after the plant is completed. Considering the importance of the fuel costs within the total costs of electricity generation in coal power stations this must have its effects on the total result. These results also prove to be valid for a variation of important cost parameters. Only if the unlikely assumption that considerable variations of influences on costs - each unfavourable effecting nuclear electricity generation - would come together would prove to be true the economic efficiency of nuclear energy would be reduced or questioned.

49257 (INIS-mf—8151) Fields of application for small HTR reactors. (Ministerium fuer Wirtschaft, Mittelstand und Verkehr des Landes Nordrhein-Westfalen, Duesseldorf (Germany, F.R.)). 13 Nov 1981. 114p. (In German). NTIS (US Sales Only), PC A06/MF A01. Order Number DE83702818.

The presentations of the symposium given by twelve leading representatives of the energy economy are reproduced. Moreover, the contributions to the subsequent discussion have been written down.

49258 (UCRL—52000-83-4, pp 17-25) **Supply side of nuclear proliferation: a look at West Germany.** Apr 1983. NTIS, PC A03/MF A01.

In Energy and Technology Review.

Research on nuclear proliferation largely entails close study of the capabilities of the nuclear programs in nonweapons countries, as well as their possible motivations to acquire nuclear weapons. It also involves looking inside the nuclear-supplier countries to identify domestic pressures encouraging exports, such as inadequate domestic markets, stagnant nuclear industries, and export control systems less stringent than US export regulations. West Germany is only one of several nuclear supplier countries that share these domestic characteristics; a similar essay could easily have been written on France, Italy, Belgium, Japan, Great Britain, or Switzerland. What makes West Germany especially interesting as a case study, however, is the wide range of technologies offered for sale and the clarity of these domestic factors. Knowledge of these factors, we believe, will lead to a deeper understanding of the process of nuclear proliferation.

2908 Waste Heat Utilization

REFER ALSO TO CITATION(S) 49428, 49451, 49455

2910 Conservation

REFER ALSO TO CITATION(S) 49234, 49333, 49417, 49421, 49422, 49423, 49424, 49425, 49426, 49429, 49442, 49443

49259 (NP—3770317) Energy saving in enterprises - a programme. (Bundesministerium fuer Wirtschaft, Bonn (Germany, F.R.). Referat Presse und Information). Mar 1981. 32p. (In German). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83770317.

Guidelines set by the Federal Ministry of Economics for promoting management consulting for small and medium-sized enterprises and for professional workers. Pt. 1 "Management consulting on energy conservation" as of Dec 12, 1980. Guidelines for the promotion of information and training courses in energy conservation. As of Dec 11, 1980.

A rational and economic energy consumption is not only important for national economics, but also for any individual enterprise. Thus, on the one hand, our energy supply is ensured to a higher degree and on the other hand the expenses provided by the enterprises can be reduced. This programme shall offer to the small and medium-sized enterprises and to the freelancers a particular financial stimulus to inform themselves about the feasibilities to save energy and consequently also production costs. This can be realized by a concrete individual consultation and/or by general educational and informative sessions. For this purpose, applicants may obtain financial assistance to the supportable costs within the scope of the available budgets. Details of the mentioned programme are given in the regulations following below, which were published in the Federal Gazette No. 37 dated February 24, 1981.

2920 Supply, Demand, And Forecasting

REFER ALSO TO CITATION(S) 48551, 48603, 48604, 49230, 49237, 49238, 49270, 49273, 49274, 49275, 49276, 49277, 49278, 49279, 49280, 49281, 49452, 49908

49260 (DOE/EIA—0385(82)) Synopsis of the annual energy review and outlook, 1982. (USDOE Energy Information Administration, Washington, DC). Apr 1983. 25p. NTIS, PC A02/MF A01. Order Number DE83015702.

Domestic energy production declined slightly in 1982, as small gains in hydropower and nuclear power production (to record levels for each), and in crude oil production, were more than offset by losses in natural gas production. Crude oil production in the lower-48 states rose for the first time since 1972. Consumption of energy by electric utilities for generating electricity dropped for the first time since World War II, to below the 1979 level. For the third straight year, domestic energy consumption declined, reflecting high prices, conservation efforts and a slowdown in economic activity. After a 4-year decline, petroleum consumption dropped below 1971's level. Natural gas consumption dropped 1.5 trillion cubic feet, to its lowest level since 1967. After a 3-year increase, coal exports fell slightly. Net petroleum imports equaled 28% of consumption, the lowest since 1972. Changes in energy

prices were mixed. Most petroleum prices dropped, but natural gas, coal, and electricity prices increased. (PSB)

49261 (PB—83-205229) Simplified techniques to estimate emissions and fuel consumption inventories (user's manual). Final report. Herlihy, E.T.; Odniceanu, M.F.; Falcocchio, J.C.; Sanchez, L.; Roberts, C. (Urbitran Associates, Inc., New York (USA)). Sep 1982. 102p. NTIS, PC A06/MF A01.

This User's Guide describes an improved approach for estimating mobile emissions and fuel consumption using a simplified method. The procedure is designed for use by planners and transportation analysts interested in estimating emissions and fuel consumption for light-duty vehicles (LDV) traveling in urbanized areas. The procedure is based on a set of look-up tables, and estimates changes in emissions and fuel consumption using changes in the number of trips and related VMT.

2930 Policy, Legislation, And Regulation

REFER ALSO TO CITATION(S) 48573, 48590, 49161, 49238, 49448, 49867, 49909

49262 (INIS-mf—8043) Decree No 82-686 of 3 August 1982 concerning the duties of the Minister delegate to the Minister of State, Minister for Research and Industry, responsable for energy. 5 Aug 1982. 1p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780796.

Published in the French Official Gazette.

This Decree further determines the competence of the Minister delegate for energy questions and provides that he will discharge the duties in that field given previously to the then Minister of Industry by Decree No 81-730 of 30 July 1981. (NEA).

49263 (NP—3770316) Senegal - energy industry 1981/82. (Bundesstelle fuer Aussenhandelsinformation, Koeln (Germany, F.R.)). Nov 1982. 14p. (In German). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83770316.

This report contains some remarks about the general energy policy, about the economical basic data of the field of energy and about the national energy programme of the Republic of Senegal. The tables to be found in the appendix give information about the consumption and the production of and the trade with petroleum products.

2940 Fossil Fuels

REFER ALSO TO CITATION(S) 48551, 48573, 48574, 48575, 48580, 48581, 48582, 48583, 48590, 48601, 48602, 48603, 48604, 48611, 48956, 49231, 49256, 49269, 49271, 49271, 49448, 49854, 49866, 50067

49264 (EPRI-EA—3015, pp 6.1-6.37) Evolution of coal-market models and coal policy analysis. Gordon, R.L. (Pennsylvania State Univ., University Park). May 1983. NTIS, PC A12/MF A01. (CONF-811285—Exc.).

From EPRI fuel supply seminar; Memphis, TN, USA (8 Dec 1981).

Coal modeling has proven one of the most popular areas in energy analysis. Several important models have been made and are widely used in policy discussions. The United States government has its favorite model, but both it and competing models are used by private organizations. With regard to the modeling effort, two basic conclusions are reached: (1) the works prove to have been quite useful in improving understanding of coal markets and particularly of how major public policy changes affect these markets; (2) this success has occurred despite severe deficiencies in the available data and the resulting necessity of analysts to make difficult to justify assumptions about coal supply conditions. 52 references.

49265 (LBL—16386) Comments on alternative bid variables as instruments of OCS leasing policy, by Mead, Moseidjord and Muraoka. Rothkopf, M.H. (Lawrence Berkeley Lab., CA (USA)). Jul 1983. Contract AC03-76SF00098. 10p. (CONF-830773—2). NTIS, PC A02/MF A01. Order Number DE83015657.

From 58. Western Economic Association annual conference; Seattle, WA, USA (20 Jul 1983).

The paper by Mead, Moseridjord and Muraoka first defines a set of criteria for evaluating leasing systems. The bulk of the paper is then devoted to evaluating the effect of cash bonus, royalty, profit share and work commitment bidding against these criteria. Finally, the paper offers two paragraphs of conclusions and policy recommendations. This comment begins by discussing and analyzing these conclusions and recommendations. After that, it makes a number of observations and raises a number of quibbles about the bulk of the paper that do not have a major effect on the conclusions.

49266 Greater access to transportation services on interstate pipelines. Anderson, R.E. (Federal Energy Regulatory Commission, Washington, DC). pp 221-233 of Proceedings of the 1982 rate symposium on problems of regulated industries. Columbia, MO; University of Missouri (1982). (CONF-820278—).

From Rate symposium on problems of regulated industries; Kansas City, MO, USA (7 Feb 1982).

The deregulation of natural gas wellhead prices raises the question of whether the current arrangement in which pipeline companies transport natural gas and also purchase and resell gas will be appropriate. There have been proposals for eliminating the wholesale or middleman function and treating the pipeline as a common carrier. The author examines the arguments for and against having pipelines transport gas for shippers other than themselves in order to provide end users with access to transportation services. He concludes that restructuring pipelines into common carriers would provide greater access, but that financial incentives or other solutions would be better. (DCK)

2950 Hydrogen And Synthetic Fuels

49267 (PB—83-199331) Synopsis of results of the first programme on the production and utilization of hydrogen within the energy R and D programme of the Commission of the European Communities (1975-79). Imarisio, G.; Toussaint, J.C. (Commission of the European Communities, Luxembourg). [nd]. 650p. (EUR—8054-EN). NTIS, PC E19/MF E19.

The main results obtained during the CEC's first program on hydrogen as an energy vector are published in the form of 64 extended abstracts dealing with three main themes:- the thermochemical production of hydrogen, hydrogen production by water electrolysis, and hydrogen use, storage, transportation and related safety aspects. The contractual data, costs of the contracts and their duration are reported in an appendix, and the themes of the research projects selected for further study in the second research program (1979-1983) are presented.

2960 Electric Power

REFER ALSO TO CITATION(S) 48575, 48582, 48956, 49240, 49448, 49830

49268 (DOE/EIA—0095(82)) Inventory of power plants in the United States. 1982 annual. (USDOE Energy Information Administration, Washington, DC. Office of Coal, Nuclear, Electric and Alternate Fuels). Jun 1983. 79p. NTIS, PC A05/MF A01 - GPO. Order Number DE83016649.

This is the first condensed annual version of the historically published inventory. The comprehensive version will be published only for each fifth year hereafter. In addition to aggregated data about existing and planned electric generating units for the United States and various regions, the comprehensive version contains detailed data about each existing generating unit operated by electric utilities in the United States, and about each electric generating unit planned for operation within 10 years of the reporting year. The most recent issues of the comprehensive version is for the reporting year 1981. The data in this condensed version are contained in the following separate chapters: summary; electric generating units; projected units; and jointly owned units.

49269 (EPRI-EA—3015, pp 7.1-7.17) **Estimating the transportation component of electric-utility fuel-supply cost.** Bronzini, M.S. (Univ. of Tennessee, Knoxville); Altouney, E.G. May 1983. NTIS, PC A12/MF A01. (CONF-811285—Exc.).

From EPRI fuel supply seminar; Memphis, TN, USA (8 Dec 1981).

Reliable tools are needed to analyze the capacity of the existing and currently planned national transportation network to accommodate anticipated fuel movements to electric utilities, and to forecast fuel-transportation costs. A transportation network has been developed to fill these needs. The model routes anticipated movements of both fuels and other commodities over a computerized representation of the nation's multimodal interregional freight-transportation network. The network model considers both types of competition to arrive at predicted mode and route selections of each individual freight movement. It also estimates the transit time, energy consumption, and transportaton cost for each commodity movement. Application of the model to anticipated future coal movements from mines to power plants is illustrated. 8 references, 2 figures, 2 tables.

49270 (EPRI-EA—3015, pp 11.1-11.27) **Outlook for fuels competing with electricity.** Cahal, R.R.; Neri, J.A. (H. Zinder & Associates, Washington, DC). May 1983. NTIS, PC A12/MF A01. (CONF-811285—Exc.).

From EPRI fuel supply seminar; Memphis, TN, USA (8 Dec 1981).

The future market share that natural gas obtains will be determined by interfuel competition and non-price factors. Utilities must face competition from distributors of natural gas and distillate fuel oil as they compete for the space heating market. In the commercial/residential market, electric utilities encounter competition in the form of price differentials between natural gas or residual oil and electricity. The future market share will continue to be based in part on the perceived costs to consumers of fuel options. The price relationship and availability of natural gas and distillate oil relative to electricity are most important in the competition for the space heating market. However, other factors must be considered such as the cost of heating equipment, or conversion, and its efficiency, regulations on the price of natural gas and cost allocation procedures, consumer psychology, builder preferences, and manufacturer promotions. 1 table.

49271 (EPRI-EA—3015, pp 12.1-12.16) **Relationship of coal and oil prices.** Stauffer, C.H. Jr.; Klein, D.E. (ICF Inc., Washington, DC). May 1983. NTIS, PC A12/MF A01. (CONF-811285—Exc.).

From EPRI fuel supply seminar; Memphis, TN, USA (8 Dec 1981).

Coal-price forecasts and the relationship between coal and oil prices are important areas of inquiry for the Electric Power Research Institute. A perspective on this relationship is discussed. There is no evidence in the historical data of any direct linkage between coal and oil prices. Long-term coal price increases in the past have resulted from production cost increases. Spot-price increases have been temporary and resulted from short-term surges in demand. The coal industry is competitive. Long-term coal prices reflect production costs. Government policy is the major factor that could cause coal price increases in excess of costs. Among the major policies that could cause coal prices to rise in excess of cost are: state severence taxes, inadequate leasing of the nation's coal resources, and transportation policies which allow the railroad industry to take monopoly rents. Currently, there is no direct linkage between coal and oil prices. The effect of oil prices on coal prices in indirect. When coal can be economically substituted directly through synfuels, the market for coal will expand substantially, and coal and oil will compete directly. 3 figures, 4 tables.

49272 **(IHZ-IML—81-340) Characteristics of the monopoly in energy supply in the Federal Republic of Germany.** Gericke, B. (Ingenieurhochschule Zittau (German Democratic Republic). Inst. Marxismus-Leninismus). Nov 1981. 18p. (In German). Fachinformationszentrum Energie, Physik, Mathematik, Karlsruhe, Germany.

The characteristics of the monopoly in energy supply in the Federal Republic of Germany, subject to the specific properties of that branch, are discussed. Special points of emphasis are the parts played by small and medium-sized capital funds in electric power supply and the treatment of electric utilities as economic and legal monopolies.

49273 **(NUREG/CP—0042) Proceedings of the workshop on electricity demand forecasting by state agencies.** Rizy, C.G. (ed.). (Oak Ridge National Lab., TN (USA)). Jul 1983. Contract W-7405-ENG-26. 136p. (ORNL/TM—8692; CONF-820284—). NTIS, PC A07/MF A01 - GPO. Order Number DE83015000.

From Workshop on forecasting electricity demand by state agencies; Washington, DC, USA (23 Feb 1982).

Portions are illegible in microfiche products.

This report documents the proceedings of the Workshop on Forecasting Electricity Demand by State Agencies. The workshop was organized by Oak Ridge National Laboratory in cooperation with the Nuclear Regulatory Commission. It was held in Washington, DC, on February 23, 1982. The workshop was intended to bring together representatives of state energy offices and public utility (or service) commissions to discuss electricity-demand forecasting methodologies. As the proceedings of the workshop, this report is a valuable source of information for forecasters of electricity or energy demand in general; it contains insights into many of the problems, solutions, and experiences of demand forecasters. A separate abstract was prepared for each of the 10 presentations.

49274 (NUREG/CP—0042, pp 5-13) **Use of the ORNL-SLED integrated forecasting system in need for power assessments.** Maddigan, R.J. (Oak Ridge National Lab., TN). Jul 1983. NTIS, PC A07/MF A01 - GPO. (ORNL/TM—8692; CONF-820284—).

From Workshop on forecasting electricity demand by state agencies; Washington, DC, USA (23 Feb 1982).

State-Level Electricity Demand (SLED), an econometric forecasting model for use in need-for-power assessments, was developed by Oak Ridge National Laboratory in the mid-1970's. The discussion of SLED includes a short description of the partial-adjustment forecasting models and their interactions; the sample results from an Indiana utility which show how the models link themselves together and how state-level forecasts are used to develop area-specific forecasts; and the weaknesses and strengths of SLED. The weaknesses are those inherent in all model projections: the potential for changing variables and the problem of variables of historical data which must be estimated. SLED's greatest strength is its ability to incorporate the interactions of important demand determinants to estimate kilowatt hour and kilowatt sales growth. 3 figures.

49275 (NUREG/CP—0042, pp 14-18) **Data-base development and econometric forecasting.** Hunt, C.E. (Colorado Public Utilities Commission, Denver). Jul 1983. NTIS, PC A07/MF A01 - GPO. (ORNL/TM—8692; CONF-820284—).

From Workshop on forecasting electricity demand by state agencies; Washington, DC, USA (23 Feb 1982).

Colorado law mandates the Colorado Public Utilities Commission (CPUC) present an energy forecast to the state legislature every two years. The CPUC decided to make these projections through the use of an econometric analysis and a data base whose information was divided into two parts, socio-economic data and utility-specific data, both extending back to 1963. The advantages of this type of forecasting are given as are the problems encountered in compiling the necessary data. The future work of CPUC is briefly summarized.

49276 (NUREG/CP—0042, pp 19-23) **MPPSP econometric load-forecasting methodology.** Kahal, M. (Exeter Associates, Inc., Bethesda, MD). Jul 1983. NTIS, PC A07/MF A01 - GPO. (ORNL/TM—8692; CONF-820284—).

From Workshop on forecasting electricity demand by state agencies; Washington, DC, USA (23 Feb 1982).

The Maryland Power Plant Siting Program (MPPSP), an office of the Maryland Department of Natural Resources, has as one of its responsibilities need-for-power analyses. Details of three of the econometric load-forecasting studies done by MPPSP are briefly discussed: PEPCO (the D.C. area), Delmarva (the Dela-

ware-Maryland peninsula), and the Allegheny Power System. The major problems and issues that are inherent in econometric forecasting are discussed.

49277 (NUREG/CP—0042, pp 24-28) **Planning for the development of electricity-demand modeling capabilities.** White, W.J. (New Mexico Public Service Commission, Santa Fe). Jul 1983. NTIS, PC A07/MF A01 - GPO. (ORNL/TM—8692; CONF-820284—).

From Workshop on forecasting electricity demand by state agencies; Washington, DC, USA (23 Feb 1982).

The progress made in the development of load-forecasting capability by the New Mexico Public Service Commission is discussed. The growing importance of load forecasting is attributed to higher costs of utility rates; its value in assisting in the analysis of potential demand and energy needs; its usefulness in helping to set utility policies; and its help in determining exogenous variables for other analytical needs. The stumbling blocks to implementation of the program are enumerated as being: (1) a lack of clearly established needs and goals by parties using the models; (2) unrealistic priorities and time frames established by the technical and policy users; (3) administrators not being fully aware of the resources necessary to conduct and verify the model studies; (4) a staff incapable of integrating all the modeling needs into a cohesive package; and (5) the misconceptions and reservations which accompany forecasting and simulation models.

49278 (NUREG/CP—0042, pp 28-32) **Electricity-demand forecasting needs in West Virginia.** Wilson, M.L. (West Virginia Public Service Commission, Charleston). Jul 1983. NTIS, PC A07/MF A01 - GPO. (ORNL/TM—8692; CONF-820284—).

From Workshop on forecasting electricity demand by state agencies; Washington, DC, USA (23 Feb 1982).

West Virginia's position on electricity-demand forecasting is surveyed including their reasons for its importance, their current forecasting techniques in use, and their future needs. Since 1973, the utilities have had to annually present the state legislature with an electricity supply-and-demand balance profile. The manner in which LINE (an acronym to describe a linear extrapolation of historical data) is produced is explained. Inadequacies in their system are thought to stem from too small a data base and lack of a large-enough demographic modeling base. Because of a positive attitude toward demand forecasting, the future of the project has bright prospects in the state.

49279 (NUREG/CP—0042, pp 58-61) **Modeling electricity demand and supply at the state level.** Camfield, R. (New Hampshire Public Utilities Commission, Concord). Jul 1983. NTIS, PC A07/MF A01 - GPO. (ORNL/TM—8692; CONF-820284—).

From Workshop on forecasting electricity demand by state agencies; Washington, DC, USA (23 Feb 1982).

The author discusses the history of the electric-power industry as evidenced by a growth in energy sales, defines demand forecasting and the role it can play in price regulation, reviews the current use of demand forecasting in New Hampshire, and outlines the mechanisms incorporated in New Hampshire's analytical supply-demand system. Optimization, or creating an energy-generating mix among competitive alternatives, can be more-readily realized if planning for the future is based upon an assessment of prospective demand. 1 figure.

49280 (NUREG/CP—0042, pp 62-71) **Regulator's perspective of electricity-demand models: planning response to uncertainty.** Mendl, J. (Wisconsin Public Service Commission, Madison). Jul 1983. NTIS, PC A07/MF A01 - GPO. (ORNL/TM—8692; CONF-820284—).

From Workshop on forecasting electricity demand by state agencies; Washington, DC, USA (23 Feb 1982).

The Wisconsin Public Service Commission (WPSC) reviews, critiques, and analyzes forecasts of future energy needs and the subsequent expansion plans for providing the service. The advantages and disadvantages of the three types of models they use (trending, econometric, and end use) are given. Three suggestions are made for minimizing the possibility of deriving wrong information from the models: (1) include a sensitivity analysis in the forecast; (2) plan as flexibly as possible; and (3) use load management at the load control on the system. Recommendations are also made to plan capacity to build in smaller increments and to investigate the cost-effectiveness of smaller-scale, short-term actions to defer high cost commitments.

49281 (NUREG/CP—0042, pp 107-122) **Demand forecasting and the power planning process in California.** Jaske, M.R. (California Energy Commission, Sacramento). Jul 1983. NTIS, PC A07/MF A01 - GPO. (ORNL/TM—8692; CONF-820284—).

From Workshop on forecasting electricity demand by state agencies; Washington, DC, USA (23 Feb 1982).

The subject of demand forecasting and the power-planning process in California is discussed. The present power-planning process is described, the current forecasting capabilities of the California Energy Commission (CEC) are discussed, and plans are announced of the direction that CEC is headed in developmental work for future forecasting capabilities. The model development work is divided into six major sectors, residential, commercial building, agriculture and water supply, industrial, other commercial, and peak/base load. A dimension unique to demand forecasting in California is the important need for conservation analysis.

49282 **New capacity in smaller packages.** Wayne, M.; Spencer, D.; Alpert, S.; Yeager, K.; Drenker, S.; Kalhammer, F.; Fickett, A.; Zeren, R.; Vejtasa, S. *EPRI (Electric Power Research Institute) Journal;* 8: No. 4, 6-13(May 1983).

Modular generation may be characterized as the use of discrete packages of generating capacity that can be replicated and added to existing utility systems. Today's financial climate requires a sharp match between capacity and demand because a major mismatch in either direction carries substantial costs. Building system capacity in small steps may be one way to optimize that match, hence the growing interest among utilities in the concept of modular generation. Technologies with modular potential include combustion turbines fired by oil or gas, hyro, geothermal, wind, integrated gasification-combined cycle, pressurized fluidized-bed combustion, the fuel cell, and storage batteries. 1 figure.

49283 **Cooling without water.** Moore, T.; Bartz, J.; Maulbetsch, J. *EPRI (Electric Power Research Institute) Journal;* 8: No. 4, 18-25(May 1983).

Shakedown tests are under way on advanced ammonia-based cooling at a heavily instrumented test facility in southern California. Favorable results could open the door to greater economy and siting flexibility for power plants in water-short areas. Dry-cooling technology may be needed in the western United States in about 40 years, and worldwide interest is growing in countries like Israel which faces growing generating-capacity needs on a heavily populated coastline. South Africa is already constructing all-dry direct condensation cooling stations near large coal deposits. 3 figures.

2980 Consumption And Utilization

REFER ALSO TO CITATION(S) 48603, 48604, 49231, 49260

49284 (DOE/EIA—0314(81)) **Residential energy-consumption survey: housing characteristics, 1981.** Thompson, W. (USDOE Energy Information Administration, Washington, DC. Office of Energy Markets and End Use). Aug 1983. 206p. NTIS, PC A10/MF A01 - GPO. Order Number DE83016668.

Portions are illegible in microfiche products.

Data in this report cover fuels and their use in the home, appliances, square footage of floor space, heating equipment, thermal characteristics of the housing unit, conservation activities, and consumption of wood. Collected for the first time are data related to indoor temperatures and the use of air conditioning. A unique feature of the 1981 survey is an increased sampling of low-income households funded by the Social Security Administration to provide them information for the Low-Income Home Energy Assistance Program. Discussion highlights data pertaining to these topics: changes in home heating fuel, secondary heating, indoor tempera-

tures, features of new homes, use of air conditioning, use of solar collectors, and wood consumption.

49285 **Effects of improved energy efficiency on U.S. energy use: 1973-80.** Hirst, E.; Barnes, R.W.; Cohn, S.M.; Corum, K.R.; Greene, D.L.; Hamblin, D.M.; Kulp, G.; Reister, D.B.; Vineyard, T.A. (Energy Division, Oak Ridge National Laboratory, Oak Ridge, TN 37830). *Energy (Stamford, Connecticut);* 7: No. 11, 897-908(Nov 1982). Contract W-7405-ENG-26.

Between 1973 and 1980, U.S. energy use grew at an average annual rate that was only one-tenth the pre-embargo rate. This dramatic change in energy growth was caused by a combination of rapidly rising fuel prices, slower economic growth, occasional shortages of fuels, and government and utility conservation programs. This paper examines the post-embargo period in terms of energy use in each of the major sectors: residential and commercial buildings, transportation, and industry. The analysis deals with two issues: what changes occurred in energy use during this period relative to pre-embargo trends and why these changes occurred. Energy use in 1980 (76 quads) was about 20 quads lower than pre-embargo trends would suggest. About half of this reduction was due to slower growth in economic activity. The remainder was due to improvements in energy efficiency, spurred primarily by rising fuel prices and also by government and utility conservation programs. The 1980 increase in overall energy efficiency (10 quads) was due primarily to technical efficiency improvements and secondarily to operational changes.

2990 Unconventional Sources And Power Generation

REFER ALSO TO CITATION(S) 48773, 48791, 48809, 49417, 49422, 49424

49286 **(PB—83-185660) Congressional justification for 1983 estimates, US Department of Housing and Urban Development. Part 2: Solar Energy and Conservation Bank, Community Planning and Development, New Community Development Corporation, Policy Development and Research, Fair Housing and Equal Opportunity.** (Department of Housing and Urban Development, Washington, DC (USA)). Mar 1982. 154p. NTIS, PC A08/MF A01.

HUD budget information for 1983 is presented for the Solar Energy and Energy Conservation Bank, Community Planning and Development, the New Community Development Corporation, Policy Development and Research, and Fair Housing and Equal Opportunity. Data relating to Community Planning and Development present figures on Community Development Grants, Urban Development Action Grants, rental rehabilitation, urban homesteading, and more. Administrative expenses and program outlays are noted for the Solar Energy and Energy Conservation Bank, the New Community Development Corporation, Policy Development and Research, and Fair Housing and Equal Opportunity. Included are summaries of budget requests, changes from 1981 estimates included in March 1982 budget estimates, an explanation of increases and decreases, and program descriptions. Data tables are provided.

49287 **Role of renewables in Hawaii's energy future.** Sathaye, J.; Ruderman, H. (Lawrence Berkeley Lab., CA). *Energy Journal;* 4: No. 2, 121-134(Apr 1983). Contract W-7405-ENG-48.

Over 90% of Hawaii's energy comes from imported petroleum. However, it has a variety of native energy sources: wind, solar, hot water, and a prime location for ocean thermal energy conversion. A recent study examines exploitation of native sources, needed technologies, socio-economic impacts, and environmental consequences, with an eye to petroleum replacement. The authors summarize the analytical methodology (which is applicable to other island environments) and present major results of the study. 13 references, 3 figures, 2 tables.

30 DIRECT ENERGY CONVERSION

REFER ALSO TO CITATION(S) 49332

3001 Mhd Generators

49288 **(CONF-810106—10) Three-dimensional flow and heat-transfer development in MHD channels.** Vanka, S.P.; Ahluwalia, R.K. (Argonne National Lab., IL (USA)). 1981. Contract W-31-109-ENG-38. 12p. NTIS, PC A02/MF A01. Order Number DE83008617.

From 19. Aerospace Sciences meeting; St Louis, MO, USA (12 Jan 1981).

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The development of the three-dimensional flow and temperature fields in an MHD channel is studied. The partial-differential equations for the three momenta, the enthalpy, and the electrical fields are solved by a finite-difference calculation procedure. The turbulence phenomenon is represented by a two-equation turbulence model, in which additional equations are solved for the kinetic-energy of turbulence and its dissipation rate calculations have been made for typical MHD channel conditions in the subsonic flow regime. Interesting secondary flow patterns have been observed to develop along the duct as the flow and electrical fields interact with each other. The detailed development of the three-dimensional flow, temperature, and electrical fields is presented.

49289 **(CONF-830634—) Engineering aspects of magnetohydrodynamics.** (Argonne National Lab., IL (USA); USDOE, Washington, DC; American Inst. of Aeronautics and Astronautics, New York; Purdue Univ., Hammond, IN (USA)). 1983. Contract W-31-109-ENG-38. 491p. NTIS, PC A21/MF A01. Order Number DE83014481.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

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Separate abstracts were prepared for 37 of the 38 papers included. One paper was previously included in the data base. (WHK)

49290 (CONF-830634—, pp 1.1.1-1.1.12) **Results from comparative analysis of different MHD generator and power train designs for early commercial power plant applications.** Hals, F.A.; Pian, C.C.P.; Demirjian, A.M.; Sadovnik, I.; Stankevics, J.O. (Avco Everett Research Lab., Inc., MA). 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

This paper presents results from analyses of MHD power trains for early commercial power plant applications. The analyses conducted were part of the first phase of a planned three-phase program for the formulation of an MHD Advanced Power Train (APT) Development Program.

49291 (CONF-830634—, pp 1.2.1-1.2.16) **Site-specific engineering assessment of a retrofit MHD topping cycle.** Nelson, G.L.; Cott, D.W.; Simmons, G.A. (Mountain States Energy, Inc., Butte, MT). 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

In order to demonstrate the capability of MHD for generating power commercially, it will be necessary to build a test facility which is of sufficiently large scale to provide benchmark test data and operational experience to the utility industry. Such a test facility has been called the Advanced Test System (ATS). One option for minimizing the capital investment that has received attention is the retrofit concept. In this scheme, the ATS would consist of an MHD power train and a Heat Recovery Seed Recovery System that would be installed as a topping unit to an existing conventional power plant. The purpose of this paper is to report on a study which was funded by the Montana Department of Natural Resources and Conservation (DNRC), the objective of which was to determine the engineering feasibility of the MHD retrofit concept in the context of a specific power plant, the J.E. Corette plant in Billings, Montana. The results of a preliminary parametric analysis

are presented, and based on these results and the site-specific constraints, an ATS design has been developed. The retrofit plant would have an MHD power train operating with a thermal input of 250 MW, an electric power output of 28 MW, and a new heat recovery seed recovery (HRSR) boiler. The HRSR would be fired in parallel with the existing Corette boiler, and the steam flows would be merged at the turbine.

49292 (CONF-830634—, pp 1.3.1-1.3.10) **Parametric study of commercial MHD/steam plant performance, cost, and cost of electricity.** Holman, R.R.; Christenson, J.A.; Lundberg, W.L. (Westinghouse Advanced Energy Systems Division, Pittsburgh, PA). 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

An analysis is described which predicts the thermal performance, cost, and cost of electricity for an MHD/steam combined cycle power plant. The work was done parametrically to show performance and cost sensitivities and to identify peak performance values of key topping cycle variables. For this purpose, a steady-state thermal model was used that integrates in a single, quick-running calculation, the topping and bottoming cycles as well as auxiliary systems such as the air separation unit and the seed regeneration plant. Economic calculations were performed using a second computer program in which component and system cost algorithms are programmed. This program runs in series with the thermal analysis code and takes most of its input from the results of the thermal calculations. Total system models are very effective in work of this kind because plant response to variations in virtually any parameter can be analyzed and peak performance points are readily identified.

49293 (CONF-830634—, pp 2.1.1-2.1.7) **Status of MHD testing at the US Department of Energy's Component Development and Integration Facility (CDIF).** Sherick, J.M.; Staats, G.E. (Mountain States Energy, Inc., Butte, MT). 1983. NTIS, PC A21/MF A01. Contract AC07-78ID01745.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

This paper summarizes the status of MHD testing at the Component Development and Integration Facility for the past ten months. This facility has been commissioned by the United States Department of Energy to test MHD components and provide development data at the nominal 50 MW/sub t/ input level. Included is the CDIF testing projection for the future as presently defined.

49294 (CONF-830634—, pp 2.2.1-2.2.23) **Significant MHD power generation test results at the CDIF.** Farrar, L.C. (Mountain States Energy, Inc., Butte, MT). 1983. NTIS, PC A21/MF A01. Contract AC07-78ID01745.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

Experimental results from MHD power generation tests have recently been obtained at the Component and Development Integration Facility (CDIF). These test results provide a preliminary characterization of AVCO designed and fabricated MHD test components and a Westinghouse designed and manufactured inverter. Data presented in the paper include MHD channel operation in both the Faraday and diagonal modes. During Faraday tests, process flows, magnetic field strength, and Faraday load values were set at conditions to demonstrate channel performance at its design point. Power generation results obtained were in agreement with the channel design performance predictions. Electric power was transmitted to the commercial power grid via an Electric Power Research Instiute (EPRI) supplied inverter during the diagonal mode tests. Operation of the channel with the inverter allowed for mapping of the channel electrical output characteristics over a broad range of plasma and load conditions. The inverter provided a stable load control for the MHD channel in each operating mode tested. Data presented in this paper show the inverter to be a useful tool for characterization of MHD channel electrical output at various plasma and load conditions, during both transient and steady state operations.

49295 (CONF-830634—, pp 2.3.1-2.3.14) **Integrated MHD generator-inverter system test results at CDIF.** Koester, J.K. (Stanford Univ., CA); Wood, P.; Farrar, L.C.; Ferraro, R.J. 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

The integrated system testing at CDIF of the EPRI/Westinghouse 3.5 MW inverter coupled to the DOE/AVCO 1A MHD generator is described. During this test program from April through October of 1982, power levels up to 1 MW were achieved and over 3 MW-hours of ac power was delivered to the Montana Power Company grid. A large low frequency oscillation in current and voltage at the dc interface was observed. Oscillation behavior and its elimination by current rate feedback control is described. Stable coupled operation in the control modes of voltage, current, and impedance were achieved. Data on inverter performance and a comparison with calculated performance are presented.

49296 (CONF-830634—, pp 2.5.1-2.5.18) **Gas dynamic and heat transfer evaluation of the CFFF LMF1 flow train.** Lineberry, J.T.; Galanga, F.L.; Gonzalez, D.E. (Univ. of Tennessee Space Inst., Tullahoma). 1983. NTIS, PC A21/MF A01. Contract AC02-79ET10815.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

Experimental results from the recent LMF1 test series at the CFFF are reviewed and analyzed. This evaluation explores the gas dynamic and heat transfer character of an integrated MHD type flow train. A reporting of the recovery characteristics of most of the major components of the LMF1 test train is included. The overall performance of the coal-fired LMF combustor at each LMF1 operating point is examined in terms of heat losses, pressure levels, and C-star efficiency. Heat flux data from the upstream portion of the test train is qualitatively disseminated. Analytical methods used to model the LMF1 test train are described and comparisons between the theoretical and experimental gas dynamic and heat transfer behavior of the LMF1 test train is given.

49297 (CONF-830634—, pp 2.6.1-2.6.15) **Development status of the TRW 20 MW/sub t/ MHD coal combustor.** Bauer, M.; Braswell, R.; Iwata, H.; Stewart, J. (TRW Energy Development Group, Redondo Beach, CA). 1983. NTIS, PC A21/MF A01. Contract AC22-81PC40502.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

This paper presents the results of recently completed, DOE sponsored, 20 MW MHD coal combustor development work at TRW. The results of TRW's 20 MW/sub t/ coal combustor development work through the year 1981 have been reported in previous MHD conferences. Here we present the results of the 1982 accomplishments. Specifically, the combustor related results of the recently completed 20 MW coal-fired power generation tests performed jointly by TRW and AVCO are discussed. For this test series, an existing TRW 20 MW/sub t/ slagging coal combustor and a supersonic AVCO channel were integrated and installed in the AVCO MK VI generator facility with a 4 telsa iron core magnet and tested for 24 thermal hours and 4.5 power hours. The present paper focuses on the combustor operating characteristics resulting from these tests and we summarize the mechanical interface issues that were addressed. We also present current test results from the 20 MW MHD coal combustor oxygen enriched, low preheat development work recently completed at TRW. This new development activity was designed to define the operational and hardware changes necessary to operate the combustor at a 900° to 1200°F preheated oxidant temperature rather than the baseline 2900°F preheat temperature used in all previous tests.

49298 (CONF-830634—, pp 2.7.1-2.7.10) **MHD generator performance comparisons between coal + ash firing.** Petty, S.; Enos, G.; Kessler, R.; Swallom, D. (Avco Everett Research Lab., Inc., MA). 1983. NTIS, PC A21/MF A01. Contract AC22-80ET15614.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

A two-stage slagging coal combustor development by TRW Corporation, was successfully integrated with an MHD generator developed by the Avco Corporation, when the two companies cooperated in an operational demonstration of a coal fired MHD power train under the sponsorship of DOE. The experimental components, rated at a nominal 20 MW thermal input, are the engineer-

ing prototypes of 50 MW/sub th/ hardware to be supplied by the contractors to the recently commissioned Component Development and Integration Facility (CDIF), a federal MHD test site in Butte, Montana. A second series of tests was conducted in which the same channel and operating parameters were employed with an oil fired ash injected combustor (AIC) to provide performance comparisons. The primary objective was the validation of using an AIC for development of coal fired MHD generators. The only significant performance variation uncovered in the comparison tests was attributable to a non-optimum method and location for seed injection in the coal-fired combustor. The corrective measures are deemed to be relatively straightforward.

49299 (CONF-830634—, pp 2.8.1-2.8.16) **Experimental investigation of ETL Mark VII MHD facility.** Kusaka, Y. (Electrotechnical Lab., Ibaraki, Japan); Takano, K.; Onda, K.; Kato, K.; Kaga, Y.; Aiyama, Y.; Irino, M.; Imatake, T.; Fukaya, Y. 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

Three times long duration generation tests have been conducted in series by the ETL Mark VII MHD facility with a cold wall Faraday type channel consisting of metal electrode walls and alumina coated peg walls. In total 430 hours generation, various electrode materials have been tested and the generation characteristics of both Faraday and diagonal modes have been examined. As the results, it was cleared that platinum and tungsten-silver were the most excellent for durability as anodes and cathodes, respectively, and the life-time of this type channel could be estimated to be about 4000 hours (at 0.7 A/cm^2). In parallel, the NO/sub x/ reduction by three de-NO/sub x/ means in the high, middle and low gas temperature regions, the desulfurization by potassium seed and the dust removal by the ESP have been examined and, as the results, the emission levels of NO/sub x/, SO/sub x/ and dusts, which were defined by the district government, could be cleared up satisfactorily.

49300 (CONF-830634—, pp 3.1.1-3.1.20) **Progress in analytical modeling of MHD power generators II.** Demetriades, S.T.; Maxwell, C.D.; Oliver, D.A. (STD Research Corp., Arcadia, CA). 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

A survey is presented of some significant results from the past 11 years of applications of the STD/MHD codes to a wide variety of MHD power generation devices and experiments. Emphasis is placed upon recent applications which have elucidated a number of important processes associated with strong MHD interaction. Among these is the magnetoaerothermal effect, for which very dramatic data have recently become available. These data confirm the earlier predictions of the existence and potential impact of this effect.

49301 (CONF-830634—, pp 3.2.1-3.2.10) **Models of the fundamental acoustic waves in plasma MHD generators.** Riahi, N.; Walker, J.S. (Univ. of Illinois, Urbana). 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

This paper compares the results of an exact three-dimensional model of acoustic waves in plasma MHD generators with the results of simpler, approximate, asymptotic solutions for the same model. The asymptotic solutions are: (a) the usual one-dimensional model which is the first term in the asymptotic solution for long wave lengths; (b) a composite, two-term, long wave length asymptotic solution; and (c) an asymptotic solution for small interaction parameters. A previous paper has considered the general wave characteristics, such as phase velocities, natural frequencies and damping coefficients. The present paper focuses on the detailed structure of the fundamental acoustic wave. In particular, the variation of the pressure fluctuations with the coordinate perpendicular to the electrodes, and the voltage fluctuations associated with this wave are considered. Both of these phenomena are the results of the Hall effects, and both are ignored by the usual one-dimensional model.

49302 (CONF-830634—, pp 3.3.1-3.3.13) **Magnetoacoustic effects on phase velocity of waves in MHD generators.** Munce, A.C. Jr.; Mitchner, M.; Koester, J.K. (Stanford Univ., CA). 1983. NTIS, PC A21/MF A01. Contract AC22-80ET15611.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

The magnetoacoustic effects on waves in an MHD generator have been theoretically and experimentally investigated. The theoretical work has involved examination of the solution to an MHD dispersion relationship. The results of this theoretical work have shown that the magnetoacoustic effect on the phase velocity can be quite large even for laboratory-scale MHD generators. An experimental technique to measure possible changes in the phase velocities has been developed. The technique is based upon analysis of the magnetoacoustic standing-wave patterns found in the MHD generator. Recent MHD generator tests have been run in the Stanford M-2 facility to test the feasibility of this technique. In general the experimental data demonstrated consistent agreement with the standing-wave analysis. Data taken from these tests have furnished good insight into the nature of the pressure fluctuations found in the generator and helped determine how experiments run in the future might best be designed to make sensitive measurements of the magnetoacoustic effect on the phase velocity.

49303 (CONF-830634—, pp 3.4.1-3.4.10) **Performance characteristics of a subsonic MHD generator loaded in the diagonal mode.** McClaine, A.W.; Swallom, D.W.; Kessler, R. (Avco Everett Research Lab., Inc., MA). 1983. NTIS, PC A21/MF A01. Contract AC22-80ET15614.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

Performance characteristics of a two terminal diagonally connected subsonic generator are presented. Comparisons are made with the performance characteristics of the same generator loaded in the Faraday mode. Good agreement is found when the diagonal data is corrected for the power dissipated in the link resistors used as crude electrode current controls. The effects of using resistors as current controls are described.

49304 (CONF-830634—, pp 3.5.1-3.5.11) **Evidence of secondary flow in Faraday MHD generators.** Girshick, S.L.; Kruger, C.H. (Stanford Univ., CA). 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

Experimental evidence is presented for the existence of secondary flows in a rectangular segmented Faraday MHD generator. This evidence consists of the results of three independent experiments which measured, respectively, electrode-wall voltage drops, electrode-wall boundary-layer temperature profiles, and the decay of temperature pulses traveling down the channel in the axial direction. In each case the observed behavior for cases with applied current but without magnetic field is correctly predicted by two-dimensional models, whereas cases with magnetic field show significant departures from the predicted behavior. These departures are seen to follow a consistent pattern which could be explained by the presence of MHD-induced secondary flows. These flows are caused by the interaction of the magnetic field with a nonuniform Hall current. An experimental program is in progress with the goal of directly measuring secondary flow velocities and associated voltage drops, with net Hall current as a parameter.

49305 (CONF-830634—, pp 3.6.1-3.6.20) **Reduction of the average electrical conductivity by a wake type plasma nonuniformity.** Hruby, V.J. (Avco Everett Research Lab., Inc., MA); Sadovnik, I.; Kessler, R.; Trefethen, L. 1983. NTIS, PC A21/MF A01. Contract AC22-80ET15614.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

The influence of a wake type nonuniformity on the effective plasma electrical conductivity and Hall parameter (σ/sub eff/ and β/sub eff/) was investigated experimentally and theoretically. A combustion driven 1 m long linear MHD generator known as the Avco Mk VII facility was used for the experiments. The nonuniformity was produced by a flat copper plate (vane) which was located

in the nozzle throat. The stagnation enthalpy defect in the wake was approximately 6%. Under this condition the optical and electrical diagnostics detected no conductivity defect. Its absence was confirmed by the generator performance which remained the same with or without the vane. An approximate analytical model showed that the conductivity in the wake can, under certain conditions, be larger than that in the free stream. Subsequently the wake conductivity defect was enhanced by injecting a small amount of water into the wake. The optical and electrical data were combined to evaluate the so-called nonuniformity factor (G). The experimental nonuniformity factor (G/sub E/) fell below that predicted by an approximate analytical expression due to Rosa (G/sub R/). Numerical investigation showed that the approximations are not valid for large conductivity defects. It is shown that for weak nonuniformities the effective plasma properties remain as predicted by Rosa (σ/sub eff/ = $<\sigma>$/G/sub R/, β/sub eff/ = $<\beta>$/G/sub R/) and for strong nonuniformities σ/sub eff/ = $<\sigma>/\sqrt{G}$/sub R/ and β/sub eff/ = $<\beta>/\sqrt{G}$/sub R/.

49306 (CONF-830634—, pp 4.1.1-4.1.12) **Survey of boundary layer arcing.** Rosa, R.J. (Montana State Univ., Bozeman). 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

The objective of this work is to collect and correlate the results of past and present arc experiments and from these predict the behavior of boundary layer arcs in full scale MHD generators. This paper describes experimental results analyzed to date, and derives a preliminary mathematical model for use in correlation and extrapolation.

49307 (CONF-830634—, pp 4.5.1-4.5.12) **Effects of cathode slag polarization on MHD generator performance.** Petty, S.W. (Avco Everett Research Lab., Inc., MA). 1983. NTIS, PC A21/MF A01. Contract AC22-80ET15614.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

A series of experiments was conducted on a slagging MHD generator to investigate the loss in channel performance brought about by slag polarization phenomena in which large reductions in slag resistivity are observed on the cathode wall. A one meter long channel with 56 electrode pairs and peg type insulator walls was driven by an ash injected, oil fired combustor operating at 14 MW thermal input. At nominal channel operating conditions of 40 to 60 kWe output and a Hall voltage of 500 to 800 volts there was a degradation in performance of approximately 10% in power and 30% in Hall voltage when the cathode wall slag was fully polarized. For newly slagging channel walls, the time required was between 80 and 100 minutes. Measurements of polarized Rosebud cathode slag conductivity ranged from 140 to 370 mhos/meter yielding an equivalent channel slag conductivity of 70 to 90 mhos/meter. By contrast, tests in which the seed was discontinued resulted in relatively no change in generated Hall voltage ($\simeq$ 500 volts) while power levels dropped to less than 1 kW, demonstrating minimal leakage in the slag layer. It is concluded that the cathode slag layer is not continuous but is periodically broken. Shorting of Faraday currents in the presence of a Hall field results in increasing current concentrations at the downstream edge of the shorted group until sufficient joule heating is produced to locally remove or thin the slag layer and create an open insulator gap capable of sustaining the Hall voltage. Using scaling laws based on the ratio of electrode pitch to channel height it is estimated that the most conductive coal slags will reduce the theoretical (infinitely segmented) power output of full scale channels between 1 and 2%.

49308 (CONF-830634—, pp 4.6.1-4.6.12) **Electrical nonuniformities in slagging MHD channels.** Simpson, S.W.; Marty, S.M. (Univ. of Sydney, Australia). 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

In an earlier work, studies of electrical nonuniformities in slagging linear MHD channels were reported. The z-transform technique was applied to the small-signal electrical equations, and stability limits in the presence of anode arcs with negative dynamic resistance were determined. Here, the linearized study is extended to include boundary layers in the flow, negative dynamic resistance in cathode arcs and intercathode slag conduction, and the effect of the cathode arc currents on intercathode conduction which results from slag burn-out. Also, nonlinear limit cycle analysis has been used to predict the final nonuniform steady states. Good agreement with experimental data has been found for two model situations: one assuming a breakdown characteristic for intercathode slag conduction, the other based on slag burn-out in conjunction with nonlinear cathode arc characteristics.

49309 (CONF-830634—, pp 4.7.1-4.7.14) **Effect of the Hall parameter and plasma boundary layers on influence coefficients for generator electrical nonuniformities.** Schlueter, R.D.; Koester, J.K. (Stanford Univ., CA). 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

A general overview of the influence coefficient theory is presented. Special case symmetric solutions for influence coefficients are discussed, as are solutions for constant and variable property asymmetric cases. The results (both computational and experimental) of influence coefficient measurements, including those associated with axial current perturbations, taken under various channel operating conditions are presented. Coefficients obtained computationally for the constant conductivity case in the absence of a Hall field are compared with those of other researchers. Results for measurements in the presence of a magnetic field show the dramatic effect of the Hall parameter (β) on influence coefficients. Computational results showing the effect of plasma boundary layers on influence coefficients are also presented for the first time. The superposition principle for a linear resistive medium as applied to the influence coeefficient technique is computationally and experimentally verified.

49310 (CONF-830634—, pp 4.8.1-4.8.12) **Approximate electrical solution of MHD generator with cathode wall nonuniformities.** Pian, C.C.P.; McClaine, A.W.; Sadovnik, I.; Swallom, D.W. (Avco Everett Research Lab., Inc., MA). 1983. NTIS, PC A21/MF A01. Contract AC22-80ET15614.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

The effect of cathode wall nonuniformities on the electrical performance of Faraday loaded generators is modeled analytically. An approximate three-dimensional model is formulated to determine the distributions of the electrical variables within the MHD channel in the presence of cathode nonuniformities. Nonuniformities in this model are treated as a coarser resegmentation of the cathode wall. The electrical model is described and the calculated results are compared with experimental data.

49311 (CONF-830634—, pp 4.9.1-4.9.7) **Effects of cathode shorting on internal MHD electrical characteristics.** Sadovnik, I.; Pian, C.C.P.; McClaine, A.W. (Avco Everett Research Lab., Inc., MA). 1983. NTIS, PC A21/MF A01. Contract AC22-80ET15614.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

The effects of slag shorted cathode wall nonuniformities on the internal electrical characteristics of Faraday loaded MHD generators are investigated analytically. A two dimensional current stream function solver is used to numerically investigate the problem. The model is described and preliminary parametric results are shown. Variations in the number of shorted cathodes, the Hall parameter, and the generator size are included in the study. Characteristic lengths for the transverse electric field profile on the electrodes and the transverse current density profile on the insulators are obtained for both the anode and the shorted cathode walls.

49312 (CONF-830634—, pp 5.1.1-5.1.10) **Mass spectrometric determination of the thermodynamics of potassium hydroxide, potassium sulfide, and minor potassium-containing species required in magnetohydrodynamic power systems.** Farber, M. (Space Sciences, Inc., Monrovia, CA); Srivastava, R.D.; Moyer, J.W.; Leeper, J.D. 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

Coal-fired open-cycle MHD power plants involve seeding of the combustion process with small amounts of potassium salts. The electric power is derived from the plasma conductivity resulting from the free electrons produced by ionization of the potassium at the high combustion temperature. In order to make meaningful computer calculations of the electric conductivity derivable from these systems, a knowledge of the thermodynamic properties of the potassium reactions and their products is required. Thermodynamic properties were obtained for several potassium-containing species by means of a series of effusion-mass spectrometric studies. These included vaporization and dissociation experiments for KOH(g) correlated by both second and third laws, and resulted in a recommended standard enthalpy of formation. An effusion-mass spectrometric study has also been completed for the thermodynamic properties, which are the first experimentally reported, of the gaseous potassium sulfides, KS and K_2S. These species appear in seeded MHD plasma and may be involved in the recovery of potassium from open-cycle coal-fired MHD electric power systems.

49313 (CONF-830634—, pp 5.2.1-5.2.11) **Effects of thermochemical data base on analysis of MHD generator performance.** Sha, C.W.; Altstatt, M.C. (Univ. of Tennessee Space Inst., Tullahoma). 1983. NTIS, PC A21/MF A01. Contract AC02-79ET10815.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

An accurate chemical modeling of seeded coal combustion products is crucial to the design and interpretation of experimental results for MHD generators. In particular, the trace compounds present in coal can have a significant influence on the calculated electrical transport properties. Experience at UTSI has shown that subtle uncertainties with regard to the trace chemical data can lead to exaggerated misinterpretations of plasma conductivity which can lead to erroneous predictions of generator electrical and gas dynamic behavior. As such, extreme care needs to be exercised in the adoption of changes in the chemical data base. A method of calculating the electrical conductivity is presented and illustrative examples which encompass computations of both thermochemical properties and representative generator performance are discussed.

49314 (CONF-830634—, pp 5.3.1-5.3.10) **Study of the effect of seed-slag interaction on the potassium concentration boundary layer in an MHD generator.** Luongo, C.A.; Kruger, C.H. (Stanford Univ., CA). 1983. NTIS, PC A21/MF A01. Contract AC22-80ET15611.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

The present work is aimed at understanding some of the physical mechanisms involved in the interaction of potassium seed with slag in an MHD channel. A potassium concentration boundary layer is assumed to grow along the walls of the generator. The heat/mass transfer analogy is invoked to calculate the mass transfer rate of potssium towards the slag. Using typical conditions for a large MHD generator, an integral method is used to evaluate the potassium concentration boundary layer thickness. The calculations are performed with the slag runoff (ash rejection) as a parameter. The increase in boundary layer resistance due to potassium depletion is calculated. This effect can be considered negligible if most of the slag is rejected, but it could represent as much as a 20% increase in boundary layer resistance under conditions of strong slag deposition rate. The effect on the overall performance will be a function of the importance of the non-uniformities in the channel.

49315 (CONF-830634—, pp 6.1.1-6.1.12) **Radial electric field limitations in open-cycle disk generators.** Lear, W.E.; Nakamura, T. (Stanford Univ., CA). 1983. NTIS, PC A21/MF A01. Contract AC22-80ET15611.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

Experiments have been performed in the Stanford Inflow Disk Generator facility with clean fuel and with coal slurry to investigate the radial electric field breakdown phenomena. The results indicate that the presence of the magnetic field has a stabilizing effect on the incipient breakdown, so that higher electric fields may be sustained than in the zero B-field case. The breakdown voltage threshold and insulator gap resistance both increased with time as the applied field was maintained, possibly indicating the evaporation of condensed seed material in the clean-fuel case, and the polarization and thinning of the slag layer in the coal slurry case. Insulator-initiated breakdown was the dominant breakdown mode in all cases. The plasma-initiated breakdown threshold was examined via the application of short-duration (100 ms) ramp-shaped voltage pulses and was found to be consistently higher than the insulator-initiated breakdown threshold for insulator gaps studied (3.2 mm and 6.4 mm).

49316 (CONF-830634—, pp 6.2.1-6.2.11) **Results of combustion driven inflow disk generator experiments.** Nakamura, T.; Lear, W.E.; Fang, Y. (Stanford Univ., CA). 1983. NTIS, PC A21/MF A01. Contract AC22-80ET15611.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

Results of the inflow disk generator experiments conducted with clean fuel and with coal slurry are discussed. The power output of the generator shows expected dependencies on the electrical conductivity, the flow field, the magnetic field and the insulator wall leakage. Results of the measurements of the electric voltage drops show that the electric current is aligned with the magnetic field when it enters or emerges from the electrode surface and that the current distribution is uniform over the electrode surface. It is shown that the current discharge is stable in the disk geometry, as the magnetic field disperses the current concentrations.

49317 (CONF-830634—, pp 6.3.1-6.3.8) **Dynamical behavior of disk type closed cycle MHD generator.** Kabashima, S.; Yoshikawa, Y.; Yamasaki, H.; Harada, N.; Shioda, S. (Tokyo Inst. of Tech., Nagatsuta, Japan). 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

The realization of fully ionized seed has been dynamically confirmed in a closed cycle disk generator by solving time dependent MHD equations. The relaxation process is examined near the inlet region of the disk generator. The electron temperature distribution along radius direction clearly shows the relaxation region which affects the channel performance. The relation between relaxation length and the recovery factor is discussed. A response of the generator to a change of load resistance is also examined.

49318 (CONF-830634—, pp 6.4.1-6.4.8) **Recent experimental results with FUJI-1 facility for closed cycle MHD power generation.** Yamasaki, H. (Tokyo Inst. of Tech., Yokohama, Japan); Kabashima, S.; Yoshikawa, K.; Harada, N.; Shioda, S.; Hasegawa, Y.; Yokota, T.; Ishimura, M.; Matsutani, K.; Tanaka, A. 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

The first phase FUJI-1 experimental facility for the closed cycle MHD power generation has been completed at T.I.T. and a series of power generation experiments has been initiated from this April. The details of the FUJI-1 facility and the results of experiments of a heat exchanger and of the fluid-dynamical test of a disk MHD channel are described in this paper.

49319 (CONF-830634—, pp 7.1.1-7.1.13) **Development of a low temperature liquid-metal MHD small scale pilot plant.** Branover, H. (Ben-Gurion Univ. of the Negev, Beersheba, Israel); El-Boher, A.; Sukoriansky, S.; Yakhot, A.; Petrick, M.; Pierson, E.; Smith, I. 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

A low temperature liquid-metal MHD pilot plant with an electrical output of 5 to 10 KW was designed jointly by Ben-Gurion University and Argonne National Laboratory. It will be built at BGU by the end of 1983. The paper presents two versions of the design.

49320 (CONF-830634—, pp 7.2.1-7.2.11) **Metal gas MHD converter development plans.** Thibault, J.P. (Institut de Mecanique de Grenoble, Saint-Martin-d'Heres, France); Joussellin, F.; Alemany, A.; Dupas, A. 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

The French liquid metal MHD program is oriented towards two directions: in the range of temperature surrounding 600 K, it concerns development of electrical power plants of 100 to 1000 kWe for which solar energy is usable as heat source. High temperatures, surrounding 1300 K, concern the production apparatus using tin/steam pair has been built at the Institut de Mecanique de Grenoble (I.M.G.) with the purpose of thoroughly testing the performance and reliability of MHD converters.

49321 (CONF-830634—, pp 7.3.1-7.3.15) **Impact of design current density on the cost and reliability of superconducting magnet systems for early commercial MHD power plants.** Hatch, A.M.; Marston, P.G.; Thome, R.J.; Dawson, A.M.; Langton, W.G.; Mann, W.R. (Massachusetts Inst. of Tech., Cambridge). 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

The impact of the design current density on the estimated cost of large superconducting MHD magnet systems was investigated with the aid of design scaling and cost estimating computer codes. Major emphasis was placed on systems of the size required for linear MHD generators in the channel power output range of 100 to 1100 MWe. Copper-stabilized NbTi windings with average current densities from 0.75×10^7 A/m^2 to 2.5×10^7 A/m^2 were considered. Results indicated that design current density has a significant effect on system cost, particularly for systems in the lower range of powers considered. For example, a reduction of roughly 35% in overall magnet system cost would be expected when design current density is increased from 1.0×10^7 A/m^2 to 2.0×10^7 A/m^2 in magnets at the small end of the size range. A reduction of roughly 30% would be expected for the same current density increase in magnets at the large end of the size range. The impact of design current on certain aspects of magnet reliability was also explored. Higher current density implies a smaller winding cross section with less space available for copper stabilizer, supporting substructure and insulation. Therefore, problems of stabilization become more critical. Practical limits for stability criteria including heat flux and ratio of liquid helium to conductor volume were examined in relation to overall winding current density. Quench protection was also investigated. Results of the overall investigation are summarized in curves of various parameters vs winding average current density, including magnet weight, magnet system estimated cost, conductor stabilizer current density, conductor copper-to-superconductor ratio and maximum terminal voltage under emergency discharge conditions.

49322 (CONF-830634—, pp 8.2.1-8.2.14) **Comparisons between experimental results and analytical predictions of seed-slag fouling in an MHD steam bottoming plant.** Chow, L.S.H.; Smyk, E.B.; Johnson, T.R. (Argonne National Lab., IL). 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

At Argonne National Laboratory (ANL), the fouling of convective heat transfer surfaces of an MHD steam plant by seed and coal ash was investigated in experiments conducted in the Fossil Energy Users Laboratory (FEUL). Data on vapor and particle deposition rates, heat transfer rates, and deposit characteristics were obtained. The test results were interpreted by an analytical model that calculated the heat transfer rates and the deposition rates of seed and ash at the surfaces of a tube bank. In this paper, the test results and the analytical model are described, and the interpretation of the test data by the model is discussed.

49323 (CONF-830634—, pp 8.3.1-8.3.14) **Turbulent mixing studies in a secondary combustor model.** Foote, J.P.; Schulz, R.J.; Giel, T.V. Jr. (Univ. of Tennessee Space Inst., Tullahoma). 1983. NTIS, PC A21/MF A01. Contract AC02-79ET10815.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

A water flow model of the secondary combustor in the Low Mass Flow MHD test train at the US Department of Energy Coal Fired Flow Facility was tested in order to determine the effects of combustor geometry and combustion air injection techniques on the flow and mixing in the secondary combustor. A dual Bragg cell laser velocimeter was used to obtain detailed two-component velocity data for various model configurations, to examine the effects on mixing efficiency of oxidizer injection velocity, oxidizer injection angle and various flow restrictions. The modeling results provide useful insights for the operation of the Coal Fired Flow Facility secondary combustor.

49324 (CONF-830634—, pp 8.5.1-8.5.12) **Ash deposition, metal corrosion, and refractory performance in a coal fired MHD test train.** Shaver, T.C.; White, M.K. (Univ. of Tennessee Space Inst., Tullahoma). 1983. NTIS, PC A21/MF A01. Contract AC02-79ET10815.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

Ash deposition, metal corrosion, and refractory performance tests were conducted in a coal-fired MHD test train using an air cooled heat exchanger, air cooled corrosion probes, and the original construction refractories as the test devices. Amount and type of metal corrosion and refractory degradation are detailed after 40 hours of coal combustion and 93 total hours of testing.

49325 (CONF-830634—, pp 8.7.1-8.7.11) **Temperature and spectral emission/transmission measurements in the DOE Coal-Fired Flow Facility.** Winkleman, B.C.; Giel, T.V. Jr.; Baucum, W.E. (Univ. of Tennessee Space Inst., Tullahoma). 1983. NTIS, PC A21/MF A01. Contract AC02-79ET10815.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

Plasma temperatures in coal-fired MHD systems are generally only measurable with optical radiometric techniques such as emission pyrometry (i.e., luminosity) and modified line reversal. However, implementation of radiometric techniques is constrained by the plasma emission and transmission characteristics. The emissions of coal-fired MHD plasmas were spectrally characterized and the effects of these characteristics on temperature measurements made with luminosity and modified line reversal techniques are considered as are the effects on temperature measurements due to the unsteady nature of the plasma emissions. It is further shown that the plasma spectral characteristics and the optical port configuration used at the DOE Coal Fired Flow Facility allow implementation of a new, compact, rugged and inexpensive photodiode-based design for a modified line reversal system. The design uses optical filters for spectral wavelength discrimination and optical-spatial rather than electro-mechanical signal separation. Concurrent measurements made during coal-fired testing with the new and standard modified line reversal systems are compared to illustrate the applicability of the new system.

49326 (CONF-830634—, pp 9.1.1-9.1.15) **Comparison between long and short duration loading faults for Faraday and diagonal type MHD generators.** Ishikawa, M.; Umoto, J. (Kyoto Univ., Japan). 1983. NTIS, PC A21/MF A01.

From 21. symposium on engineering aspects of magnetohydrodynamics; Argonne, IL, USA (27 Jun 1983).

Unsteady behaviors caused by external long and short-duration loading faults are numerically analyzed and compared with each other to make clear effects of recovery from loading faults. Four high-interaction MHD generators are examined: i.e., subsonic Faraday, supersonic Faraday, subsonic diagonal, and supersonic diagonal generators. Unsteady, one-dimensional gasdynamical equations are solved by the 1969 MacCormack method with the usual infinite segmentation assumption for electrodynamics. It is shown that a quick recovery from loading faults becomes important except for the case of subsonic diagonal type generator. A short fault is more harmful than an open fault in the Faraday configuration, whereas the contrary results are obtained for the diagonal type. Disturbances become larger in the Faraday than in the diagonal configurations. Nominal flow fields can be re-established rapidly after the recovery from the loading faults for supersonic conditions.

49327 **(DOE/ET/10815—87) Cold-flow model study of turbulent mixing in a secondary combustor.** Foote, J.P. (Tennessee Univ., Tullahoma (USA). Space Inst.). Dec 1982. Contract AC02-79ET10815. 157p. NTIS, PC A08/MF A01. Order Number DE83016376.

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The research conducted was a cold-flow model study of the flow and mixing in a secondary combustor. The modeled secondary combustor is installed in the flow train of the Coal-Fired Flow Facility (CFFF) at The University of Tennessee Space Institute. An objective of the investigation was to determine the effects of various operating parameters on the mixing efficiency of this typical industrial combustor. The secondary combustor is a square cross-sectioned duct having rows of ports on two opposite walls. Air is injected through the ports to mix with the flow coming from the CFFF primary combustor and complete the combustion of gas produced by the fuel-rich primary combustion process. The cold flow model was 1/6 scale, using water as the working fluid to permit experimental conditions of high Reynolds number to be obtained. To perform the experimental flow field study, a dual Bragg cell laser velocimeter was used to obtain detailed two-component velocity data. Measurements of mean velocities, turbulence intensities, turbulent kinetic energy, Reynolds stress, and velocity-time history were obtained. Five test cases were run with the model. The flow was found to oscillate periodically in all cases. Observations revealed that the oscillation was caused by vortices, produced by interaction of the jets and the incoming bulk flow, which were shed periodically. One recirculation zone always formed upstream of the jets and another recirculation zone usually formed downstream. The size of the downstream zone varied from case to case and it was completely absent when a 50% downstream area reduction was tested.

49328 **(DOE/PC/12993—T1) Analysis and evaluation of the test results of the US/Netherlands 5-MW (thermal) closed-cycle MHD-generator experiments at Eindhoven University, The Netherlands. Final report, October 1, 1982-February 28, 1983.** Zauderer, B. (Coal Tech Corp., Merion, PA (USA)). 1983. Contract AP22-82PC12993. 77p. NTIS, PC A05/MF A01. Order Number DE83009347.

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A brief study was made of the closed cycle MHD generator results obtained in a 5 MW(thermal) power, blowdown tests series, with a cold wall heat sink channel, at the University of Eindhoven. These results were compared with MHD generator experiments, and theoretical models based on these experiments, obtained with several generator configurations in a nominal 10 MW (thermal) power shock tunnel. The results were also compared with those obtained in a 3 MW (thermal) closed cycle MHD blowdown experiment. The objective of this review was to determine the parameters governing the electrical and gas dynamic performance of the 5 MW(t) heat sink, MHD generator, in order to select a test plan for an upcoming series of experiments in that facility with a US designed, hot wall, MHD generator. The following conclusions were reached: (1) The very low open circuit voltages measured may be due to internal short circuits through the boundary layers, or the results of inadequate electron transport to the measuring probes. The latter cause does not impact the generator performance, while the former cause results in significant power reductions. (2) The best measured enthalpy extraction of 7%, reported to date, was about 1/3 of the 20% value predicted by a 1-dimensional MHD generator model. It is estimated that the following internal losses can account for the observed result: Electrode voltage losses due aerodynamic boundary layers and electrode sheaths- 3% points; ionization relaxation at the generator entrance- 5% points; and internal shorting through the generator boundary layers and end regions, as well as losses due to electromagnetic induced oblique shocks- 5% points. Based on the published data, it is not possible to discriminate between the last two loss mechanisms.

49329 **(DOE/PC/40502—T1) Coal-fired MHD combustor-development project: Phase IIIB. Fourth quarterly technical progress report, 1 December 1982-31 March 1983.** (TRW Energy Development Group, Redondo Beach, CA (USA)). 20 Apr 1983. Contract AC22-81PC40502. 65p. NTIS, PC A04/MF A01. Order Number DE83015773.

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The Fourth Quarterly Technical Progress Report of the Coal-Fired MHD Combustor-Development Project (Phase IIIB) presents the accomplishments for the period 1 December 1982 to 31 March 1983. The scope of work covered by this Quarterly Report includes the Low Preheat Development 20-MW/sub t/ test activity, the Coal Particle-Size and High-throughput Performance characterization test activity, and the 50-MW/sub t/ detail design activity. Progress is reported. The feasibility of utilizing a coal-fired vitiator to provide a temperature boost from 800°F to 2900°F preheat was demonstrated. The nominal air-inlet condition to the coal-fired vitiator was 1100°F and 34 mole % oxygen. The combustion dynamics of the slagging stage, when operated with the coal-fired vitiator, remains essentially unchanged from nominal high preheat slagging-stage performance. The best slag recovery was 88.2%. The corresponding heat loss in the first-stage section, excluding the coal vitiator, was 8.7%. Continued 20-MW/sub t/ combustor characterization tests at nominal 2900°F preheat have identified the following performance characteristics: (1) the 20-MW/sub t/ combustor slag-rejection performance is not as sensitive to coal grind as initially anticipated; (2) the combustor slag-rejection performance shows a slightly negative slope with increased air preheat; (3) the high throughput combustor scaling tests indicate that the 20-MW/sub t/ combustors best slag-recovery operating point is approximately 22 to 25 MW/sub t/ with a first-stage equivalence ratio of approximately .7; and (4) the first stage heat loss decreased with increasing thermal input. The first stage heat loss at 30.2 MW/sub t/ was 6.02%. All details designs for the 50-MW/sub t/ combustor first-stage section, second-stage section, batch slag tank, and the 2900°F air preheat vitiator were completed and the Critical Design Review (CDR) was held on 30 March 1983.

49330 **(DOE/PC/40502—T2) Coal-fired MHD combustor-development project: Phase IIIB. Third quarterly technical progress report, 18 August-30 November 1982.** (TRW Energy Development Group, Redondo Beach, CA (USA)). 20 Dec 1982. Contract AC22-81PC40502. 20p. NTIS, PC A02/MF A01. Order Number DE83015817.

The third quarterly Technical Progress Report of the Coal-Fired MHD Combustor-Development Project (Phase IIIB) presents the accomplishments for the period 18 August through 30 November 1982. Work on task 9 Continued 20-MW/sub t/ Combustor Testing was continued during this quarter. Progress during tis reporting period is reported. Detail design of the coal-fired vitiator components was completed and released for fabrication. Fabrication of the coal vitiator components was completed on 20 October 1982 and delivered to CTS. A new auxillary coal feed system for the coal-fired vitiator was designed, fabricated, assembled and delivered to CTS. The installation of the combustor hardware and the vitiator hardware was completed. Reactant feed lines, cooling-water lines, and instrumentation installations were initiated. This work is about 95% complete. Computer program revisions were approximately 95% complete during the quarter. A summary report of the TRW-AVCO Combustor/MHD Channel integration test was submitted to the DOE.

3005 Fuel Cells

REFER ALSO TO CITATION(S) 48774, 49223

49331 **(AD-A—125786/4) Analysis of SAC (separate air cooled) design. Final report.** Schneider, T. (Energy Research Corp., Bethel, CT (USA)). Dec 1982. 9p. NTIS, PC A02/MF A01.

The SAC stack design for the powerplants and its incorporation into the current 3 and 5 kW program was analyzed and the findings are reported here.

32 ENERGY CONSERVATION, CONSUMPTION, AND UTILIZATION

REFER ALSO TO CITATION(S) 48506, 48816

49332 (DOE/ER/30044—T1) Technology assessment for energy conversion and conservation. Final report. Belding, J.A.; Shapiro, M.D. (Research and Management Technicians, Inc., Gaithersburg, MD (USA)). Jul 1983. Contract AC01-82ER30044. 69p. NTIS, PC A04/MF A01. Order Number DE83016476.

The major thrust of this effort was to assemble a panel of seven technical experts with varied backgrounds who could take a fresh approach to recommending research topics in the area of energy conservation and conversion. The Panel had two meetings, with the goal of developing a prioritized menu of significantly worthwhile applied research topics suitable for government support. The Panel chose to study six scientific/technical disciplines: (1) Thermodynamics, (2) Electrochemistry, (3) Heat Transfer and Fluid Flow, (4) Materials Science, (5) Building Physics, and (6) Tribology. A total of 23 specific research topics were proposed within these diciplines and are individually discussed. A prioritization methodology was developed for ranking the 23 proposed research topics. The methodology included first, a scoring algorithm where scores were assigned to each project for a number of evaluation criteria and second, a subjective review by the panel members to determine the final ranking of the proposed research topics. This approach was utilized because it provided a technique for systematically evaluating a large number of diverse research projects using a common set of criteria and also allowed the Panel sufficient flexibility to compensate for the fact that some of the data used in the scoring algorithm were not well documented. Of the eleven evaluation criteria considered, the five chosen by the Panel as most important were (1) social, institutional, and environmental factors, (2) type of fuel saved, (3) potential for energy savings, (4) probability of technical success, and (5) economic factors (capital cost, operation and maintenance cost, and payback period). The final ranking is shown.

49333 (PB—83-185850) Economic Commission for Europe, Committee on Housing, Building, and Planning: National Response Paper. (Department of Housing and Urban Development, Washington, DC (USA)). 1982. 43p. NTIS, PC A03/MF A01.

Energy productivity in the United States improved by 4.5 percent in 1981, the biggest increase in over 30 years. Energy consumption declined by 3.9 percent in 1980 and by a further 3.3 percent in 1981. The United States is importing less than 13 percent of its total energy needs, as opposed to 24 percent in 1977. These dramatic changes are due to the increased use of alternative renewable resources rather than conventional fuels, public awareness of the need to conserve energy, and the many energy conservation and research programs and new energy policies instigated since 1977. Major tools used in encouraging energy conservation have included federally supported research, development, and demonstration projects; technical assistance; grants, loans, and other financial incentives; Federal regulations and voluntary standards; the reduction of institutional and regulatory barriers to conservation; and dissemination of information to public and private entities and individuals. The report discusses the evolution of national energy policy since 1977, describes the major programs through which energy considerations have been included in community development and redevelopment, and summarizes the results in energy savings and the use of renewable resources. Footnotes and one table are included.

3201 Buildings

REFER ALSO TO CITATION(S) 48794, 48913, 49456, 49457

49334 (AD-A—127870/4) Electronic time switch evaluation study. Final technical report. Thurber, L.R. (Army Construction Engineering Research Lab., Champaign, IL (USA)). Mar 1983. 22p. (CERL-TR-E—184). NTIS, PC A02/MF A01.

This report describes a study which tested and evaluated the feasibility of using electronic time switches to reduce the electrical energy consumption of Army buildings which may not be suited to other energy-saving techniques like the Energy Monitoring and Control System. The study emphasized heating, ventilating, and air-conditioning (HVAC) system controls in office and community support buildings. Electronic time switches were installed in 12 buildings at Fort Carson, CO, and Fort Knox, KY. Test results showed savings of between 12 kWh and 99 kWh per day fo the electrical energy consumed in the test buildings. Payback periods ranged from 5 months to 3-1/2 years. This report also includes guidance on selecting and installing electronic time switches on HVAC system controls.

49335 (BMFT-FB-T—83-044) Rationalization and further development of a thermographical measuring procedure for the determination of energy losses. Breunig, H. (Bundesministerium fuer Forschung und Technologie, Bonn (Germany, F.R.)). Apr 1983. 204p. (In German). NTIS (US Sales Only), PC A10/MF A01. Order Number DE83751096.

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With the aid of thermography, energy losses on buildings and industrial plants can be determined. TUeV Rheinland was commissioned by the GFMRT to carry out practical tests on an existing mobile thermography unit. The results showed substantial shortcomings which restricted large-scale application. Therefore the GFMRT commissioned TUeV Rheinland to improve the system so as to ensure operational availability and rational use. This aim was attained, especially in relation to the data store and the evaluation of the infra-red thermograms. Additionally, various measuring methods for determining the actual size of energy losses were examined in respect of their practical applicability. An extensive error study analyzes the influence exerted on the thermographical measuring procedure. It shows the possibilities and limitations of the system and sets the conditions under which the measuring procedure can be successfully applied.

49336 (BMFT-FB-T—83-086) TRIFOCAL-mirror system applicated within the lighting technique for energy saving. Titze, G.; Rose, D.; Schulz, U. (Bundesministerium fuer Forschung und Technologie, Bonn (Germany, F.R.)). May 1983. 92p. (In German). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83751098.

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The use of mirror material within the lighting technique for taking advantage of the existing light power is well-known. It is being examined, whether by using a special mirror system within the lighting technique, the light output of single light fittings and therewith the economy for planned lighting projects, considering the special requirements of the appropriate visual assignment, can be increased. Through various test series an approval could be achieved that by using the developed mirror systems in the area of indoor lighting for the user high energy saving costs are possible.

49337 (BMFT-FB-T—83-092) Energy indices related to buildings. Brendel, T.; Guettler, G. (Bundesministerium fuer Forschung und Technologie, Bonn (Germany, F.R.)). May 1983. 180p. (In German). NTIS (US Sales Only), PC A09/MF A01. Order Number DE83751101.

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Aim and goal of this research project was the development of a method suited for the energetic evaluation of buildings and for the provision of energy-saving strategies and flexible in respect to the requesites of practical engineering, the necessary data collection effort and the significance of the results. Main subjects are: definition of energy indices (EI) of buildings; conceptualization of a model which explains energy indices as a result of building, HVAC-system and user parameters; design of a building data collection form; regression analysis of approximately 150 administrative buildings; derivation of an EI-formula for heated and air-conditioned buildings; comparison of the EI-method with other procedures such as EDP-simulation; examples of the EI-approach at energy analysis of buildings. Furthermore the EI-method as a possible instrument for setting standards and extrapolation of the macroeconomic potential of energy-saving measures.

49338 (CONF-830229—) **1983 international daylighting conference.** Vonier, T. (ed.). (American Inst. of Architects, Washington, DC). 1983. Contract W-7405-ENG-48;W-7405-ENG-26. 423p. NTIS, PC A18/MF A01. Order Number DE83013799.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

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Eighty-three papers and extended abstracts are included. One paper was abstracted previously for EDB. Separate entries were prepared for eighty-two papers. (MHR)

49339 (CONF-830229—, pp 15-20) **Availability of solar radiation and daylight.** Aydinli, S. (Universitaet Berlin, Germany). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

For the use of solar energy and for daylighting, heating and cooling of interiors the irradiances and illuminances on inclined surfaces, produced by solar radiation, must be precalculated sufficiently for different sky conditions. The Precalculation of these data on the basis of a mathematical model will be described, their accuracy and applicability for different stations discussed.

49340 (CONF-830229—, pp 21-28) **Daylight variability in rooms with different orientations.** Kendrick, J.D. (Univ. of Adelaide, Australia). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Arguments are advanced for further research and development of a design method which considers dynamic aspects of daylight in preference to methods for minimum or average sky conditions. Data are presented to show that for Australian conditions the most common state of the sky providing daylight availability is one which is neither clear sky nor overcast, but partly cloudy and variable. In pursuit of an objective of development of a new approach for daylighting design which takes account of this variability, details of a pilot experimental study of daylight variability in black and white model rooms with different orientations are reported. The study shows the relationships between global illuminance variability measured on an unobstructed horizontal plane and that occurring simultaneously in model rooms facing primary compass headings (N, S, E and W). It is evident from comparisons made of measurements taken inside black and white model rooms that both the inter-reflection component of room daylight and orientation are important contributors to the dynamic aspects of daylight in habitable spaces.

49341 (CONF-830229—, pp 41-42) **Definition of typical and average exterior daylight conditions in different climatic zones and time periods.** Kittler, R. (Inst. of Construction & Architecture, Bratislava, Czechoslovakia); Ruck, N. 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

49342 (CONF-830229—, pp 43-46) **Daylight availability.** Navvab, M.; Karayel, M.; Ne'eman, E.; Selkowitz, S. (Lawrence Berkeley Lab., CA). 1983. NTIS, PC A18/MF A01. Contract AC03-76SF00098.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

49343 (CONF-830229—, pp 47-52) **Simple sky model for daylighting calculations.** Pierpoint, W. (Naval Civil Engineering Lab., Port Hueneme, CA). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A set of formulas for daylight availability are presented. The formulas allow the calculation of horizontal and vertical illuminances from the sun and the sky for clear, partly cloudy, and cloudy conditions. The ratio of vertical to horizontal illuminance is used to select the proper coefficient of utilization table when using the IES Lumen method for sidelighting. For the obstructed sky, formulas to calculate equivalent sky exitances are derived. The exitances of exterior surfaces (overhang, skyline, street, etc.) replace sections of the sky or ground. A simple area source equation is used to determine the resulting horizontal and vertical illuminances.

49344 (CONF-830229—, pp 53-56) **Predicting daylight from skies of random cloudiness.** Tregenza, P.R. (Univ. of Nottingham, England). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Over a two-year period, continuous measurements were made of illuminance on external horizontal and vertical surfaces, and simultaneously within scale models exposed to the sky. It was found that the ratio between internal and external horizontal illuminance varied significantly with the type and quantity of cloud. A histogram illustrates the ratio between the internal illuminance from a single North-facing window and the external illuminance, over all weather conditions except when there was direct sunlight on the ground. The measured ratios varied from just above 1% to nearly 6%, approximately half the readings falling into the range 2% to 3%. The calculated ratio for the CIE Overcast Sky, the daylight factor, was 2.2%.

49345 (CONF-830229—, pp 57-60) **Calculation of daylight factor dominated by intermediate sky.** Nakamura, H. (Nagoya Inst. of Tech., Japan); Oki, M. 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Based upon the two CIE Standard Skies and the Intermediate Sky which is defined in this paper, and upon their frequencies of occurrence, a Mean Sky has been composed and a new advanced method of daylighting design has been proposed as the application of the Mean Sky. The outline of this new method and its practical procedure of daylighting estimation has been stated and a few of its figures and tables for the calculation have been shown with the examples of its application.

49346 (CONF-830229—, pp 61-62) **Generation of daylight and sunlight availability data for cities throughout the United States.** Robbins, C.L.; Hunter, K.C. (Solar Energy Research Inst., Golden, CO). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

49347 (CONF-830229—, pp 63-66) **Zenith luminance for daylighting calculations.** Karayel, M.; Navvab, M.; Ne'eman, E.; Selkowitz, S. (Lawrence Berkeley Lab., CA). 1983. NTIS, PC A18/MF A01. Contract AC03-76SF00098.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Based on analysis of large quantities of data collected in San Francisco, California, for over three years, a new zenith luminance equation was derived. Earlier results were validated using the data collected and the equations that were derived from the data. The relationship between horizontal illuminance and the zenith luminance was studied. Finally, the effect of circumsolar luminance on the zenith luminance and sky luminance distribution was examined and new parameters were estimated for the diffusion indicatrix.

49348 (CONF-830229—, pp 69-70) **Comprehensive approach to the integration of daylight and electric light in buildings.** Ne'eman, E. (Lawrence Berkeley Lab., CA). 1983. NTIS, PC A18/MF A01. Contract AC03-76SF00098.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Effective daylighting inside buildings depends to a large extent on the shape and size of the building. As a rule, it is difficult and often impossible to illuminate a building exclusively by daylight. The visual consequence of deep penetration of daylight into large interiors through windows and rooflights (skylights) are discussed.

49349 (CONF-830229—, pp 71-76) **Daylighting in museums.** Ne'eman, E. (Lawrence Berkeley Lab., CA). 1983. NTIS, PC A18/MF A01. Contract AC03-76SF00098.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The utilization of daylight in exhibition areas of museums and art galleries is examined and the merits, disadvantages, and design difficulties involved in making use of this source of illumination are discussed. Two daylighted galleries that demonstrate successful daylight strategies are described. One employs a highly sophisticated daylight-admitting system, while the other relies more on a fixed design. It is concluded that daylight can safely and satisfactorily be used to illuminate objects of art during most daytime hours of the year.

49350 (CONF-830229—, pp 77-84) **Sunlighting as formgiver for architecture.** Lam, W.M.C. (William Lam Associates, Inc., Cambridge, MA). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

sunlighting is defined as the deliberate control of sunlight in buildings for the comfort and pleasure of occupants and the minimization of energy consumption and long-term costs. It then focuses on what makes a good environment, the similarities between good design with artificial lighting and sunlighting, and the common need for integrated building systems. Case studies show how sunlighting devices can be integrated into building systems, and the powerful effect they can have on architectural form.

49351 (CONF-830229—, pp 87-92) **Very, very simple hand calculations for daylighting.** Jones, B.F. (Lighting Research Lab., Orange, CA). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Daylighting computations for building interiors may frequently be performed to sufficient accuracy, considering the variability of the primary source, by the use of the two-dimensional configuration factor chart, or lune protractor. This device, when used with a cross-sectional drawing of the interior, allows the prediction of illumination at any point in the interior with any combination of fenestration and reflecting surfaces. Only two simple equations are needed in addition to the protractor, and all calculations may be done by hand or on a simple four-function calculator. Accuracy can be as great as desired; but the variability of daylight suggests that it is futile to strive for great accuracy; but to work only to the needs of the situation.

49352 (CONF-830229—, pp 93-98) **Johnson controls Salt Lake City office building design: daylighting studies.** Watson, D. 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The daylighting design studies undertaken for the Johnson Controls Branch Office now built and occupied in Salt Lake City are described. The principal passive solar techniques adopted were a combination of daylighting and solar controls through south-facing windows and a clerestory. The resulting design achieves a balance of daylighting and passive solar gain in winter with requirements to shade the window glass in summer. It was found that adding windows, even if shaded, adds to the summer cooling load. The added summer cooling load was deemed acceptable, however, because Salt Lake summers are relatively dry, permitting the use of evaporative cooling, much more energy efficient than refrigerant cooling where local climate conditions permit. It was further determined that adding insulation to roof and walls and adding thermal mass to the interior (through earth berms and insulating on the outside of the masonry structure) provide reductions in both heating and cooling loads.

49353 (CONF-830229—, pp 99-104) **Interactive compter graphic daylighting design tool.** Milne, M.; Liggett, R.; Campbell, C.L.; Lin, L.C.; Tsay, Y.T. 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A fast simple interactive computer program which plots daylight curves has been developed for hands-on use by architects at the very beginning of the design process. It calculates daylight illumination levels using the well known IES/LOF method. The most important feature of the program is its friendly interface, which means that designers with no computer literacy can easily descibe their building and quickly progress through as many design modifications as desired. The program is self-instructional, giving first-time users a demonstration of its various features, then inviting them to go back and input their own building. The program is written in Fortran IV and runs on a Tektronix storage tube graphics terminal.

49354 (CONF-830229—, pp 105-108) **Impact of occupancy schedules on skylight energy performance.** McCluney, R. (Florida Solar Energy Center, Cape Canaveral). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The influence of different levels of occupancy upon the annual energy performance of skylit commercial buildings in Miami, Florida and Caribou, Maine is investigated. Based upon the predictions of a skylight annual energy performance computer program, it is shown that occupancies as short as two to three hours per day can yield positive annual cash flows for properly designed installations in Miami. Greater periods of occupancy are required for positive cash flow in Caribou.

49355 (CONF-830229—, pp 109-114) **Correlation of measured interior daylight with calculated solar gains.** Davenport, M.R.; Nall, D.H. (Heery Energy Consultants, Inc., Atlanta, GA). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A method is presented for developing simple statistical models of interior daylight levels in a space as a function of solar gain. The daylight-to-solar gain relationship, or Statistical Daylight Model (SDM), can be used to evaluate the tradeoffs between daylighting and space cooling and heating loads for both the calculation of design HVAC loads and the estimation of annual energy consumption in buildings. To develop the SDMs, measurements are taken of daylight in a scale model of the study building, along with coincident solar radiation readings, for a representative set of sky-cover and seasonal conditions. This data sample reflects the presence of both direct and diffuse sunlight in the space. Solar gains are calculated for the room corresponding to each set of solar radiation values using a solar gain/shading algorithm. The relationship of solar gain to daylight is derived by regression from this modified empirical data base, and is expressed in the form of a linear equation. The method was used to generate prototype SDMs for a hypothetical commercial building design in Atlanta, Georgia.

49356 (CONF-830229—, pp 115-120) **SOLITE 1 computer program.** Brown, J.P. 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Architects and engineers have relied on model studies, computer simulations and graphic analysis, to determine the ratio of interior to exterior illumination on a horizontal plane (daylight factor), but have only been able to determine annual savings after laborious calculations. SOLITE 1 converts calculated or measured instantaneous daylighting factors for cloudy skies (and optional clear, sunny skies) into annual energy and economic savings, with minimal additional effort. This program is an improvement on the procedure developed to analyze the energy and economic savings for the Pacific Beach Post Office, San Diego, CA 92109, a passive solar heating, cooling, and daylighting demonstration building.

49357 (CONF-830229—, pp 121-122) **Simplified method of calculating the interaction of daylighting and building energy.** Rundquist, R.A. (Ross and Baruzzini, Inc., Saint Louis, MO). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A hand-calculation procedure has been developed to calculate the daylighting and energy impact of windows. The procedure

and examples of its use are given. The procedure is designed for use in the schematic building design stage by architects and engineers to make early quantitative design decisions on glazing types and sizes, and on daylighting controls. Included are the calculation of interior daylighting levels due to a given window as well as the yearly lighting, cooling, and heating energy costs due to the window, relative to a solid wall. Workplace daylighting level and lighting-savings-fraction are calculated for both June 21 and December 21. Yearly energy cost is calculated, so that various fenestration alternatives can be compared for total economic impact.

49358 (CONF-830229—, pp 123-124) **Simplified method for predicting energy savings attributed to daylighting.** Robbins, C.L. (Solar Energy Research Inst., Golden, CO). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A method for estimating a building's energy savings attributed to daylighting by predicting the percentage of the year that the electric lighting system is not in use is described. This depends on the particular control strategy chosen, standard work year, and the amount of light [as a daylight factor (DF)] reaching any given station in the building. The method is based on research on daylight and sunlight availability for selected cities in the United States.

49359 (CONF-830229—, pp 125-128) **Energy nomographs as a design tool for daylighting.** Sain, A.M.; Rockwell, P.G.; Davy, J.E. (Burt Hill Kosar Rittelmann Associates, Butler, PA). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Decisions about daylighting must be made early in the design process; therefore, an effective design tool must be available to determine the effects of various daylighting options quickly and accurately. The Energy Nomographs are such a tool since they can determine the net decrease or increase in annual energy consumption (including heating, cooling, lighting, etc.) of most daylighting design options early in the design process. The Energy Nomographs are a graphic energy design tool developed to aid designers in making cost effective decisions about many energy features. This paper explains their use and presents an example of daylighting design using this graphic design tool.

49360 (CONF-830229—, pp 129-130) **Total flux method of illumination calculations.** Hunter, K.C.; Robbins, C.L. (Solar Energy Research Inst., Golden, CO). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

49361 (CONF-830229—, pp 131-134) **Interactive design tool for daylighting analysis.** Dwyer, L.; Franta, G. (ENSAR Group, Lakewood, CO). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The ENSAR Daylighting Analysis Program provides an interactive design tool for analyzing the use of daylighting in buildings. The system was designed for portability and to provide quick feedback to designers on daylighting design and options. The output data from the system contains essential information on the intensity and distribution of daylight. Its primary use is with scale models, but can also to used in full-sized buildings or test modules. The ENSAR Daylighting Analysis Program provides a fast and accurate assessment of daylighting schemes and advances the state-of-the-art for daylighting design tools.

49362 (CONF-830229—, pp 135-140) **Validation of the Microlite I daylighting model.** Bryan, H.J.; Krinkel, D.L. (Massachusetts Inst. of Tech., Cambridge). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A recently developed microcomputer based program called Microlite I, for evaluating daylighting design in the early stages of the design process, is described. The program was developed around a set of input menus, where design parameters can be easily created, stored, replaced or changed to determine the effects of various design alternatives. The output from the program offers several formats in the familiar architectural representation of plan, section, and parallel projection. Results have been validated against test data from an extensive series of physical scale model measurements, as well as results from a large main-frame computer program. Future developments that will further increase Microlite's power and usefulness are also discussed.

49363 (CONF-830229—, pp 143-148) **Case study: Lockheed Building 157 deep daylighting/innovative lighting concepts for a large office building.** Windheim, L.S.; Riegel, R.J.; Davy, K.V.; Shanus, M.D.; Daly, L.A. 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

This paper features Lockheed Missiles & Space Company's Building 157, a 600,000 square foot energy-efficient technical engineering office building in Sunnyvale, California. Discussion is directed towards the building's deep daylighting design solution for reducing energy consumption, the integration of daylighting with its indirect fluorescent lighting system, the design methodology, and annual energy performance. Daylighting features include sloped ceilings, interior and exterior light shelves, exterior shading devices, and a large interior litetrium. A task/ambient fluorescent lighting system was selected to complement and integrate with the daylighting scheme. Light levels are automatically controlled by photocells. A comprehensive daylight modelling effort involved 1/8"-scale and 3/8"-scale models, as well as a fullscale mock-up which was used to test electric lighting alternatives and to fine-tune design solutions. Daylighting model testing was accomplished for both clear sky and overcast sky conditions. Annual energy performance of the building was forecast with the DOE 2.1 computer program at a level that is less than half that allowed by California's Title 24 energy budget.

49364 (CONF-830229—, pp 149-154) **Daylight in the design process.** Ellinwood, S. (Scott Ellinwood & Associates, Ventura, CA). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

This paper deals with the specific example of a daylit office building in Ventura, California, occupied as of November 20, 1982. It describes the methods by which passive and low-energy cooling and heating strategies were integrated into the design along with appropriate state-of-the-art HVAC and electrical systems. It examines the priorities set by the client and design team, alternatives considered, methods of analysis and criteria for incorporation into the final design. It describes design tools such as graphic methods, preliminary computer analysis for optimum orientation in relation to existing mature trees, sizing of shading devices, methods of glare control, and cost effectiveness of various HVAC systems. It illustrates daylighting model design, construction, testing, and results. It shows the resulting predicted annual energy consumption of 22,700 Btu/s.f/year, compared to the California Title 24 Energy Law standard of 39,000 Btu/s.f./year for this building. Other characteristics of the resulting design are: office landscape-systems furniture interiors, carpet squares with undercarpet flat cable wiring and indirect H.I.D. lighting system controlled by photocells; a greenhouse lobby/employee lounge utilizing natural ventilation and thermal mass with heat recovery to office spaces; and construction cost within the client's budget for a conventional building.

49365 (CONF-830229—, pp 155-160) **Window configuration: designing for daylighting and productivity.** Magnusson, M. 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

In response to the need to minimize energy use in the new Social Security Administration, Northeast Program Service Center (SSA/NEPSC), scheduled to begin construction in Spring 1983, an analysis of window energy use and daylighting potential in various window alternatives was undertaken. Eight possible windows were studied, out of which three were selected for complete analysis as generic solutions to dealing with the various window energy issues.

The three window options selected were analyzed for energy use, first cost and effect on the interior environment. The window which maximized high daylighting glazing, provided the lowest energy use, lowest first cost and greatest benefit to the occupants was the clerestory configuration with view windows.

49366 (CONF-830229—, pp 161-166) **Application of daylighting in commercial and industrial buildings.** Boyer, L.L. (Oklahoma State Univ., Stillwater); Roush, R.W.; Duke, B.W. 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Daylighting design procedures, physical modeling, and as-built results are addressed in detail for two recently constructed award-winning projects. A typical four-office module utilizing a common lightcourt is studied for the Conoco Research and Development Center in Ponca City, Oklahoma. Both perimeter offices and toplighted interior laboratories are reviewed for the Halliburton Research and Development Center in Duncan, Oklahoma. Other subsequent projects of a similar nature are also identified and briefly reviewed. The use of scale models with subsequent analytical evaluation at the concept design stage has shown to be a validated, invaluable technique both for determining relative distribution of daylight illumination as well as estimating absolute illumination levels. Distribution predictions are quite accurate, while actual light level predictions are within the factor of safety normally utilized in the technical design disciplines.

49367 (CONF-830229—, pp 167-172) **Problems in the design and analysis of the Pacific Beach Post Office, San Diego, CA 92109.** Brown, J.P. (New School of Architecture, Chula Vista, CA). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The Pacific Beach Post Office is a passive solar heating, cooling, and daylighting demonstration building designed for the United States Postal Service, Western Region. The primary goals are to minimize artificial lighting, cooling, and fan power while using conventional materials in a way that could be a model for retrofit applications. Lighting energy for this type of facility is about fifty to eighty percent of the total energy costs. Skylights, clerestories, and windows light interior surfaces and work stations. Louvers and blinds used to control solar glare combine with white interiors to diffuse the light and greatly improve distribution and illumination. Interior windows allow light to cascade from room to room. Staged photocell switching of fluorescent lights combined with conservation will save over 74% of the annual lighting energy. The building will consume less than 40% of the energy allowed under present title 24 requirements. Problems encountered in the conventional design process, in the evolution of the design, and in the daylighting analysis are discussed.

49368 (CONF-830229—, pp 173-176) **Daylighting aspects of the DOE passive commercial buildings program.** Gordon, H.T. (Burt Hill Kosar Rittelmann Associates, Washington, DC); Kurkowski, T.L. 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The US Department of Energy is conducting an experimental program to assess the use of passive solar technologies in non-residential buildings. Begun in 1979, this effort has consisted of design, construction and performance evaluation for 23 buildings throughout the country. A group of ten projects, in which daylighting was a primary element of the design solution, has been selected for analysis in this study. The purpose of this paper is to present data regarding the daylighting aspects of ten projects and to address the following topics: presentation of physical parameters, primary daylighting features and predicted performance of the projects; comparison of physical aspects of the building (such as aperture and floor area) to predicted lighting energy savings and total energy savings; and preliminary measured performance results for lighting energy savings in selected buildings and responses of users to lighting aspects.

49369 (CONF-830229—, pp 177-184) **Single- and multi-layer large-span membrane structures for daylight, energy control, and savings.** Burt, M.; Kent, E.; Ne'eman, E.; Shrifteilig, D. (Israel Inst. of Tech., Haifa). 1983. NTIS, PC A18/MF A01. Contract AC03-76SF00098.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Membrane-covered structures are examined. Such structures offer many advantages and their cost of construction is lower than that of equivalent alternatives. However, these thin, single-layer membrane covers cannot provide the control of daylight and heat required to make them environmentally satisfactory and energy-efficient. To improve the performance of membrane covers, a new solution has been studied. Double-layer members can be built without severe technical difficulties and provide a much higher degree of static and dynamic control. Further work is being carried out to study the option of incorporating into the two layer membrane structures solar collectors between the layers, thus converting the large area of the membrane cover into an active solar system.

49370 (CONF-830229—, pp 185-188) **Case study for new construction: the Window Rock Elementary School addition, Window Rock, Arizona.** Felts, D. (Felts Associates, Albuquerque, NM). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The addition to the Window Rock Elementary School consists of 16,000 square feet of administrative and instructional space. A central atrium garden space provides a pleasant circulation area and acoustic buffer between the perimeter classrooms. Classroom activities are expanded into the atrium space by means of sliding garage type doors. Native American culture, the high desert environment, educational programming, the budget, and energy conservation are design determinants. Form, color, and texture are drawn from the magnificent landscape of large rock and mesa formations indigenous to the region. The predominant skin material is masonry stratified in random bands of reds, browns, and ocher. The masonry patterns are repeated on the interior walls of the atrium space. The skylights and reflector/sunshades are major design elements. The back side of the reflector/sunshades are painted primary blue and relate to the brilliant high desert sky. The reflecting surface is a natural aluminum finish. Skylight glazing extends to the exterior walls and turns down into the vertical plane. The vertical glazing is highlighted with a red frame and a wide band of blue glazed masonry again, relating to the sky.

49371 (CONF-830229—, pp 189-190) **Design considerations for the daylighting of new commercial buildings.** Daryanani, S. (Syska & Hennessy, Inc., New York, NY). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

49372 (CONF-830229—, pp 191-196) **Daylighting design for new California State Office Building - Site 1-C.** Bryan, H. (Massachusetts Inst. of Tech., Cambridge); Bazjanac, V. 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The daylighting features used in the design of a new 160,000 ft^2 California State Office Building (Site 1-C) are described. The building represents an integration of simple and proven daylighting concepts that contribute to an extremely energy efficient end result. Covered are implications in building configuration, office space layout, fenestration design and artificial lighting/control alternatives. The various daylighting features considered are discussed and particular solutions highlighted.

49373 (CONF-830229—, pp 197-204) **Daylighting performance of four daylighted libraries in Europe designed by Alvar Aalto.** Moore, F.; May, H. (Miami Univ., Oxford, OH). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The daylight illumination performance of four European libraries designed by the late Finish architect, Alvar Aalto, are presented. The buildings are located in Seinajoki, Rovaniemi, and Otaniemi, Finland, and Wolfsburg, Germany. All make extensive use of daylighting. Each was measured dimensionally and photometrically, and photographed extensively. Features common to all four libraries are discussed briefly in terms of architectural response to daylighting and subjective occupant response to the luminous environment. The Seinajoki library is discussed in greater detail in terms of specific daylighting devices and effects. The designs of each of the four buildings are presented graphically as exploded three-dimensional and orthographic drawings. The measured illumination performance is presented as isolux contours plotted on floor plans.

49374 (CONF-830229—, pp 205-210) **Steilacoom High School, a study in energy-conscious design.** Rising, P.S. (Burr, Lawrence, Rising Architects, Tacoma, WA). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The goals, design process, the goal-setting retreat, the general facility description, the effect of energy-design elements, and daylighting techniques are presented. (MHR)

49375 (CONF-830229—, pp 213-218) **General calculation method of illuminance from a vertical louver blind system.** Matsuura, K. (Kyoto Univ., Japan). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A general calculation method is developed for determining illuminance from a vertical louver blind system on the working plane. The illuminance is composed of direct component from window and indirect, internally reflected, component. In one case the window faces to the uniform sky, obstruction and ground, and in another case the slats are uniformly illuminated by the direct sunlight. Then an overlapping of the both cases can be roughly applied to all weather conditions.

49376 (CONF-830229—, pp 219-222) **New coefficient of utilization model for daylighting calculation in energy analysis programs.** Selkowitz, S.; Kim, J.J.; Spitzglas, M. (Lawrence Berkeley Lab., CA). 1983. NTIS, PC A18/MF A01. Contract AC03-76SF00098.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A daylighting model was added to the DOE-2.1 energy analysis program. The model is integrated into the hour-by-hour load calculation and is sensitive to a wide variety of climatic and building design parameters. The daylight illuminance model itself operates as a pre-processor within the DOE-2 program, generating daylight factors for a variety of sun and sky conditions, which are then stored in the program. In the hour-by-hour computational loop, the program interpolates between daylight factors appropriate for the sun and sky characteristics of that hour. The program tests each hour for heat gain and window luminance and allows the simulation of operable shading devices to control solar gain and glare.

49377 (CONF-830229—, pp 223-226) **Transmission function approach to daylight-introducing systems in the built environment.** Spitzglas, M. (Lawrence Berkeley Lab., CA). 1983. NTIS, PC A18/MF A01. Contract AC03-76SF00098.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A new method of quantitative photometric analysis of daylight-introducing systems is described. It is assumed that a daylight system, no matter how complex, has two basic parts: input - one or more elements at which the incident outdoor daylight flux is collected, and output - one or more elements from which the daylight, having been transmitted through the system, is introduced into the space to be illuminated. The mathematical operator that makes it possible to define the properties of the photometric flux emitted from the output of the particular system, due to any possible photometric field being introduced to the input of that system, is the photometric Transmission Function (TF) of that particular system. Thus, specifying the photometric conditions at the input of a system, and activating the TF operator of that particular system will provide the properties of the light source of the output of that system, as it radiates (in the visible range) toward the interior space.

49378 (CONF-830229—, pp 227-230) **Mathematical model for daylighting and daylight control.** Muigg, P. (Lichtplanung Christian Bartenbach, Innsbruck, Austria). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A system theory for daylighting is developed, leading to a general and comprehensive analysis of the problem, which takes into account the requirements of visual perception. By introducing discrete luminance functions, a very efficient algorithm for calculating the effects of daylight is developed which allows realistic and sophisticated simulations of daylighting situations to be performed. By use of an artificial sky, special light directing elements can be measured, giving the same input data for the simulation as the program mentioned above. Finally, the calculated or measured coefficients are used in a control mechanism the same way as for the simulation program, making sure that the values predicted can definitely be realized.

49379 (CONF-830229—, pp 231-232) **Computer program for the calculation of daylight level in a room.** Jordaans, A.A. (Inst. of Applied Physics, Delft, Netherlands). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A computer program has been developed, which calculates daylight caused by the direct incident daylight, reflected daylight from opposite buildings, ground and interreflected daylight from walls, ceiling and floor on an arbitrary place in the room. Input data are the geometry of the room, reflection coefficients of walls, ceiling and floor and the dimensions of the proper building and the surrounding buildings.

49380 (CONF-830229—, pp 235-242) **Instrumentation for daylighting research at the Florida Solar Energy Center.** McCluney, R. (Florida Solar Energy Center, Cape Canaveral, FL); Goebel, D. 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Several instruments have been developed in support of the Fenestration Research Program at the Florida Solar Energy Center. These include a solar calorimeter, a skylight test building and associated radiation sensors, an integrating sphere spectroradiometer, an all sky camera, a Daylight Availability Sensor Array, and a Fast-Response Multichannel Photometer. The latter two instruments are described in some detail and results of their use in typical measurement situations are presented.

49381 (CONF-830229—, pp 243-244) **Calibration laboratory for the calibration of photometric sensors.** Hunter, K.C.; Harr, K.S. (Solar Energy Research Inst., Golden, CO). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Instrumentation is in place for both availability measurements and scale model tests. Measurements include: total and diffuse illuminance on a horizontal; total and diffuse irradiance on a horizontal; vertical illuminance both with and without ground-reflected light on all four cardinal compass orientations; zenith luminance; long-term model testing; and short-term model testing.

49382 (CONF-830229—, pp 245-248) **Flux mapper system for the analysis of luminance data.** Robbins, C.L.; Hunter, K.C. (Solar Energy Research Inst., Golden, CO). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A prototype, all-sky flux mapper has been developed. The flux mapper is a video system which provides for the rapid, real time processing of daylighting luminance data.

49383 (CONF-830229—, pp 249-252) **Portable sky luminance meter.** Murdoch, J.B. (Univ. of New Hampshire, Durham); Levin, R.E. 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The development of an instrument to collect sky luminance data over an extended period of time and store it on cassette tape is discussed. Data are collected automatically by positioning a photometer using stepping motors under microprocessor control.

49384 (CONF-830229—, pp 255-260) **Lenses which improve skylight performance.** Lemons, T.M. (TLA-Lighting Consultants, Inc., Salem, MA). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The possibility is examined of using a lens in a horizontal skylight to provide the necessary direct sunlight control without a loss of efficiency. Such a lens would have to control direct sunlight by spreading it into a useful beam. The lens would also have to efficiently direct skylight into the room. The beam control should produce satisfactory results for the wide range of morning to evening sun angles as well as the sun's high summer path versus low winter path. Other considerations include the lens alignment versus sun path, high angle glare limitations, and beam variations for single story building applications versus multistory light well and clerestory applications. The needs and limitations for lenses to improve the performance of skylights are therefore numerous.

49385 (CONF-830229—, pp 261-266) **Solar optics: development and implementation.** Eijadi, D.A. (BRW Architects, Inc., Minneapolis, MN). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The problem of introduction of sunlight into deep interior spaces of large and midsized commercial and institutional structures through the use of Passive and Active Solar Optic tracking systems is addressed. Two types of tracking Solar Optic Systems were developed and tested for inclusion in the Civil/Mineral Engineering (C/ME) Building, a 150,000 sq. ft. laboratory/classroom building mandated by the Minnesota State Legislature as a comprehensive earth-sheltered energy demonstration building. A full size model of the active Solar Optic system was mathematically modeled, built and tested by graduate students from the University of Minnesota School of Architecture and Landscape Architecture. The sunlight was guided through four sharp turns and subjected to a total of 13 transmission losses over a total projection distance of 60'. The maximum light transmission efficiency achieved with this prototype system was 28%. A theoretical 30% maximum was possible for this particular system. The average efficiency between an extremely dirty system and a freshly cleaned system was concluded to be 17%. Based on the findings, it is possible to expect efficiencies as high as 60% for future systems. The passive Solar Optic system was conceived and modeled at the consulting firm of Bennett, Ringrose, Wolsfeld, Jarvis, Gardner, Inc. It is principally a new form of fenestration control which reduces the aperture size to lighted area ratio and delivers sunlight fixed in one or two axes. Both systems have the capability of incorporating a high-efficiency central source of artificial lighting - such as Zenon Arc - to provide a system independent of the sun.

49386 (CONF-830229—, pp 267-270) **Design and performance of light shelves.** Selkowitz, S.; Navvab, M.; Matthews, S. (Lawrence Berkeley Lab., CA). 1983. NTIS, PC A18/MF A01. Contract AC03-76SF00098.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Light shelves have been used with windows for many years to reduce glare from the sky while still admitting reflected skylight and sunlight. Building designers are now experimenting with new light shelf designs that provide control of direct sun penetration, enhanced daylight distribution deeper in the room and control of sky glare. Many of these designs are sufficiently complex that they cannot be modeled analytically so most studies are conducted using scale models. Very little test data have been published on this subject.

49387 (CONF-830229—, pp 273-278) **Daylighting the middle school.** Hutton, P.C. (W.C. Muchow and Partners Architects, Inc., Denver, CO). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Attitudes toward program, energy and daylighting in school buildings have evolved in the last 40 years. Daylighting is generally not a high priority with school administrators. In meeting the demands of program, budget, and schedule, the architect has difficulty incorporating daylighting into school design. Three recent middle schools illustrate the obstacles to daylighting design and suggest approaches within the means of the typical architect.

49388 (CONF-830229—, pp 279-282) **Comparison of differing strategies for two university projects.** Bobenhausen, W.; Lewis, S. (Energy Design Collaborative, Inc., Scarsdale, NY). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The daylighting strategies and analysis techniques employed in the design of two university buildings are compared, to illustrate how similar levels of performance were achieved within the context of two very different sets of architectural aesthetics and client requirements. The point is not so much that daylighting works, but rather that it works by different means for different situations. The two buildings discussed are to have similar hours of occupancy and are located in climatically similar cities. The Belfer Center addition to the John F. Kennedy School of Government, Harvard University is in Cambridge, Massachusetts. The new library and computer center addition to Mart Science and Engineering Library, Lehigh University, is in Bethlehem, Pennsylvania. Both new buildings will be occupied quite intensively seven days per week year-round, including all daylight hours after 8AM.

49389 (CONF-830229—, pp 283-286) **Conversion of a mirrored artificial sky to a clear sky distribution.** White, R. (Concordia Univ., Montreal, Quebec). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A rectangular artificial sky with a top lit diffuse area and mirrored side walls can provide an accurate standard C.I.E. overcast sky source for daylight model studies. An inexpensive and quick conversion of this source to a clear sky distribution allows more extensive model investigations. The conversion permits the model's windows to see a relative clear sky luminance distribution opposite the sun when the solar altitude angle is 40°. This represents a reference design condition that shows the change in room luminance and illuminance values due to a brighter horizon and darker near zenith sky region. The mirrored surfaces are covered with a white matte stretched cloth drape. The ceiling surface is covered with a mosaic of different matte grey reflectances. This enclosure is illuminated by a U shaped perimeter source adjusted to provide the required luminance distribution for reference points. An error analysis shows the effect of different room location geometry and establishes a zone of allowable modeling sizes. Details of the construction and calibration are included to allow duplication by lighting designers.

49390 (CONF-830229—, pp 287-288) **Use of inflatable structure in daylighting research.** Garvin, W.L. (Texas Tech Univ., Lubbock). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

49391 (CONF-830229—, pp 289-290) **State of the art in scale-model photometry for evaluating daylighting in buildings.** Spitzglas, M. (Lawrence Berkeley Lab., CA). 1983. NTIS, PC A18/MF A01. Contract AC03-76SF00098.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Scale-model photometry (SMP) is a daylight evaluation. Its present state of the art is discussed, with the intent of suggesting

further specific developments. Daylight computer programs are discussed as another daylight evaluation tool.

49392 (CONF-830229—, pp 293-298) **Modelling energy savings from daylighting strategies.** Cole, R.J.; Harder, L.W.; Ostevik, A.S. (Univ. of British Columbia, Vancouver, Canada). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Physical models of office spaces were used to generate daylight distribution data throughout the year for differently oriented facades. The reduction in electrical lighting was subsequently computed for several different switching strategies, thereby achieving a more precise description of the lighting load in numerical energy analyses.

49393 (CONF-830229—, pp 299-302) **Daylight calculation for working areas in consideration of energy saving.** Aydinli, S. (Lichttechnik der Technischen Universitaet Berlin, Germany). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

In the past the basis for the sufficient daylight in interior was only the daylight factor concept at the uniform overcast sky. Today the visual contact to the outside and a sufficient brightness (for dwellings only) of the interior are important. For working areas the daylight in interior is only important to minimize costs and energy consumption in consideration of artificial lighting, heating and cooling of interior. The basis for the optimization of daylight in working areas is described. The influences of the artificial lighting, heating and cooling of interior are discussed.

49394 (CONF-830229—, pp 303-306) **SKYMOD-annual energy performance simulation model for skylights.** McCluney, R. (Florida Solar Energy Center, Cape Canaveral). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Skylight annual energy model SKYMOD uses typical hourly weather (SOLMET) data for any of 254 locations in the United States to calculate the solar radiant heat and light inputs to a building through a specified system of skylights and keeps track of all energy flows into or out of the skylights for each of the 8760 hours in a year.

49395 (CONF-830229—, pp 307-308) **Simplified daylighting savings for nondaylighting building energy simulation programs.** Ander, G.D.; Maeda, B. (California Energy Commission, Sacramento). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A sensitivity analysis was conducted for non-residential buildings. The purpose of this parametric analysis was to determine which variations in building parameters actually have significant energy impacts. A generic building model was developed and implemented in conducting this sensitivity analysis. The generic model is a square building composed of five thermal modules with significant energy use differences. There are four perimeter modules, whose energy use is expected to be affected by the impact of wall and window variations (weather dominated) and one interior module where energy use is expected to be dominated by internal loads. The generic model was used as an analytical tool in modeling the energy impact of building parameter variations as well as architectural and mechanical energy saving measures on the energy use of each module.

49396 (CONF-830229—, pp 311-316) **Influence of the window upon energy consumption, room temperature and life cycle costs of office buildings.** Mueller, H. (Schmidt Reuter Ingenieurgesellschaft, Koeln, Germany). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A comparison of typical windows, varying as to solar control, daylight utilization and thermal insulation has been carried out. The annual energy consumption for heating, cooling and lighting has been calculated by means of a dynamical computer simulation for a one-person office room with four different window orientations. For the lighting, it was assumed that each of the two installed rows of luminaires could be switched off separately when a mean lighting level of 500 Lux was reached in its zone by daylighting. The annual energy consumption is calculated for rooms with and without air-conditioning. In the case of air-conditioning, three different types of system are considered. The economic evaluation of the various types of window is accomplished by annual equivalent costing, consideration being given to capital and maintenance costs for windows and air handling systems, as well as energy costs for lighting, heating and air-conditioning. For the evaluation of windows in rooms without air-conditioning, the maximum room temperature in summer was taken into consideration as an additional aspect.

49397 (CONF-830229—, pp 317-330) **Use of DOE-2 to determine the relative energy performance of daylighted retail stores covered with tension supported fabric roofs.** Hart, G.H.; Blancett, R.S.; Charter, K.F. (Owens/Corning Fiberglas Corp., Granville, OH). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The energy use of conventially roofed and fabric roofed retail stores having the identical space layouts, schedules, and occupancy are compared. Annual energy use was determined in a series of cities by using the DOE-2.1A computer program to perform energy analyses. Additional information had been gained from a more intensive study and monitoring of a fabric covered store, of a similar design, in San Jose, California. This case study had concluded that the fabric roofed structure has a lower energy use than that of a similar store covered with a conventional roof. Therefore, it was recognized from the start that at least some fabric roofed spaces can be more energy efficient than conventionally roofed spaces. The input to the DOE-2.1A computer program that was used for the energy analyses is described.

49398 (CONF-830229—, pp 331-336) **Importance of economics in sizing skylight systems.** McCluney, R. (Florida Solar Energy Center, Cape Canaveral). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The influence of varying skylight area coverage ratios upon various skylight economic performance indicators is investigated using a skylight annual energy performance computer simulation program. It is shown that the choice of an economic performance goal has a strong influence upon the optimum number of skylights to be installed.

49399 (CONF-830229—, pp 343-344) **Incorporating daylighting techniques in a microprocessor program for determining optimal energy conservation strategies in new buildings.** Meckler, M. (Meckler Energy Group, Encino, CA). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

49400 (CONF-830229—, pp 345-346) **SKYSIZE: a simple procedure for sizing skylights based upon statistical illumination performance.** McCluney, R. (Florida Solar Energy Center, Cape Canaveral). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

49401 (CONF-830229—, pp 347-350) **Glazing energy performance and design optimization with daylighting.** Johnson, R.; Sullivan, R.; Selkowitz, S.; Nozaki, S.; Conners, C. (Lawrence Berkeley Lab., CA). 1983. NTIS, PC A18/MF A01. Contract AC03-76SF00098.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Technical performance data are provided that suggest how various aspects of fenestration performance are interrelated. Cases when thermal performance alone is the primary concern and others in which the combination of thermal and daylighting effects is the critical issue are included. DOE-2.1B is the primary simulation tool. Multiple regression analysis is used to examine results from a large set of data and to establish correlations among the relevant variables. In order to study systematically the effects of fenestration design on building energy performance a prototypical five-zone module was designed as representative of commercial office design. The design details were developed through a series of sensitivity studies in which basic building design and operating parameters were varied systematically and then fixed for the base case.

49402 (CONF-830229—, pp 351-354) **Daylighting analysis for classrooms using DOE-2.1B.** Gates, S.; Wilcox, J. (California Dept. of General Services, Sacramento). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A unilateral daylighting analysis of classrooms in a hot valley California climate was made using the DOE-2.1B Building Energy Analysis Computer Program. The strategies investigated were 30%, 50%, and 70% glazing, glazing height, orientation, and overhangs. It was found that the optimal glazing area that minimized overall energy consumption (including heating and cooling) was 50% glazing, mounted high on the wall, oriented either north or south, with a 4 foot overhang. This configuration resulted in a 90% reduction in lighting energy, and a 45% reduction in overall energy use.

49403 (CONF-830229—, pp 359-360) **Daylighting with windows, skylights, and clerestories.** Treado, S.; Gillette, G.; Kusuda, T. (National Bureau of Standards, Washington, DC). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

49404 (CONF-830229—, pp 363-368) **Daylighting and artificial lighting control.** Sain, A.M. (Burt Hill Kosar Rittelmann Associates, Butler, PA). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A complete daylighting system must include a proper automatic control system for the artificial lights. Selecting the control system requires a knowledge of the available controls and a thorough understanding of the intended application. Many control types have characteristics which make them appropriate for various applications. All control devices are made up of two generic components: (1) a sensing device to measure the daylight and (2) a controller which either switches or dims the lights. Dimming and switching controls can be used individually or combined in a hybrid system. The designer must select the proper control based on the characteristics of the occupied space. These characteristics include: quality of the space, lamp and/or ballasts used, fixture layout and room size, quantity of daylight, economic considerations, and many others. The best control system will reduce the artificial lighting consumption economically without adversely affecting the quality of the space.

49405 (CONF-830229—, pp 369-370) **Experiences with energy saving, dc operated, daylight fluorescent lamps for office buildings.** Walz, A. 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

49406 (CONF-830229—, pp 371-372) **Impact of lighting controls on daylighting applications.** Verderber, R.R.; Rubinstein, F. (Lawrence Berkeley Lab., CA). 1983. NTIS, PC A18/MF A01. Contract AC03-76SF00098.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The four lighting control strategies are considered: scheduling, lumen depreciation, tuning, and daylighting; the cost to implement each; and the resulting energy savings. Their cost effectiveness was evaluated by considering the payback period and their total return for 20 years.

49407 (CONF-830229—, pp 373-376) **Photo-electric control of equi-illumination lighting systems.** Rubinstein, F. (Lawrence Berkeley Lab., CA). 1983. NTIS, PC A18/MF A01. Contract AC03-76SF00098.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Computer simulations of the performance of dimmable lighting control systems driven by ceiling-mounted photosensors were run based on measured daylight levels in two test rooms under different daylight conditions. Dimmable lighting control systems using the simple control algorithm incorporated in most commercially available systems were found to maintain generally higher illumination levels with less variability when the control photosensor was shielded from direct light from the window. None of the examined systems provided sufficient electric light to meet the target light levels at all times. Thus, to achieve a true equi-illumination system, photo-electrically controlled lighting systems may need to incorporate more complex control algorithms than those typically employed.

49408 (CONF-830229—, pp 377-380) **Impact of electric lighting efficiency on the energy saving potential of daylighting from roof monitors.** Fontoynont, M.; Place, W.; Bauman, F. (Lawrence Berkeley Lab., CA). 1983. NTIS, PC A18/MF A01. Contract AC03-76SF00098.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

Current developments in electric lighting systems include more efficient hardware, improved lighting control strategies, and proposed reductions in the required illuminance on the work plane for common office tasks. In order to investigate the effects of some of these advanced electric lighting designs on the amount of energy that can be replaced by daylighting, a developmental version of the building energy analysis computer program BLAST was used to perform simulations of a prototypical, single-story office building. Total annual energy consumption was computed using weather data from three locations in the U.S.: New York, Los Angeles, Atlanta. For each location, two electric lighting designs were first tested on the baseline building (no roof monitors), to compare the energy requirements for current-practice and more efficient electric lighting designs. Then roof monitors were added to evaluate their energy saving potential for both of the electric lighting designs. The results show that improving electric lighting system efficiency and adding daylighting both have the potential for substantially reducing lighting electricity consumption and the energy cost of operating the building. The results also indicate that the potential benefits of daylighting are lower for a building outfitted with a highly efficient electric lighting system, although these benefits are still significant.

49409 (CONF-830229—, pp 383-384) **Impact of daylighting on peak electrical loads.** Choi, U.S.; Johnson, R.; Selkowitz, S. (Lawrence Berkeley Lab., CA). 1983. NTIS, PC A18/MF A01. Contract AC03-76SF00098.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

In order to generalize the results of this study, a prototypical five-zone office module was designed to provide a configuration representative of commercial office construction. In this phase of the study the daylighted zone was limited to a series of perimeter offices 4.8 m (15 ft) deep. The energy performance of this module under varied fenestration treatment was then analyzed for a range of representative climatic conditions in the contiguous US. The principal parameters relating energy consumption to daylight utilization are installed electric lighting power, lighting control strategy, and design illuminance levels in the space. Daylight illuminance levels in the space are a function of fenestration properties, window management strategy to control solar gain and glare, and room characteristics. Thermal performance is dependent on the thermal properties of the fenestration as well as on other characteristics of building design and operation. The interplay of all of these factors is examined to enhance understanding of peak load components.

49410 (CONF-830229—, pp 385-392) **California Energy Commission building standards development project: daylighting for the mass building market.** Schade, J.; Ander, G. (California Energy Commission, Sacramento). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The California Energy Commission, (CEC) working under the legislative mandate of the Public Resources Code, Section 25402 and 25612, is developing energy efficiency standards for new nonresidential buildings. The standards are being developed in cooperation with the state's building community and are slated for adoption by the CEC in 1983 and 1984. Expected to go into effect statewide one year thereafter as an upgrade of the current Title 24 energy requirements, the standards will call for the cost-effective use of energy conservation and passive solar energy measures in new commercial and governmental buildings. The California legislature directed the CEC to develop and adopt updated energy efficiency standards for new nonresidential buildings throughout the state. The CEC has launched a program that will emphasize cost effective standards, simplified design and compliance tools and streamlining of California building standards.

49411 (CONF-830229—, pp 393-396) **Impacts of daylighting on electrical and cooling peak demands in commercial buildings.** Bobenhausen, W.; Lewis, S. (Energy Design Collaborative, Inc., Scarsdale, NY). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The effects of daylighting as a major conservation and load management strategy are illustrated for a theoretical eight-story office building of 120,000 gross square feet. Holding the basic building design constant, the benefits of daylighting are analyzed for five different cities (New York City, Phoenix, Chicago, West Palm Beach, and San Francisco) and their utilities. The detailed analysis is limited to implications for New York City which has an existing stock of over 250 million square feet of office buildings.

49412 (CONF-830229—, pp 397-400) **Zoning for daylighting in Midtown Manhattan.** Kwartler, M. (Kwartler/Jones, New York, NY); Masters, R. 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

The history of zoning for daylighting in Midtown Manhattan is traced. The disadvantages of various zoning regulations are described. The 1982 regulations with its reliance on the Daylight Evaluation Chart is discussed. (MHR)

49413 (CONF-830229—, pp 403-404) **Occupant response to lighting controls affecting office work station environments.** Ne'eman, E.; Sweitzer, G. (Lawrence Berkeley Lab., CA). 1983. NTIS, PC A18/MF A01. Contract AC03-76SF00098.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

49414 (CONF-830229—, pp 413-414) **Requirements for the daylighting of dwellings and work-places: standardization based on research.** Seidl, M. (DIN Deutsches Institut fuer Normung, Berlin). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

49415 (CONF-830229—, pp 419-421) **Barriers to the exploitation of daylighting in building design.** Cooper, I. (Univ. of Cambridge, England); Crisp, V.H.C. 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A small, detailed investigation is described aimed at identifying whether designers are attempting to use daylighting as a means of reducing fuel consumption when designing office accommodation. Data have been collected through a series of in depth, focussed interviews conducted with members of selected architectural and engineering practices. The contents of these interviews are analyzed. The results show that at least three separate groupings can be identified amongst the designers interviewed, with respect to their attitude to daylighting. For two of these groupings the provision of daylight design aids - existing or subsequently improved - will do little to extend the exploitation of daylighting for energy conscious design. Rather, there is a need to overcome two tendencies; the neglect or indifference shown to daylighting by some as a pertinent issue in building design and the lack of credance which others place in the idea that daylight can be usefully exploited or that its exploitation will result in fuel savings.

49416 (CTH-JVG—9) **Earth heat for energy and oil conservation in apartment houses.** Jacobeson, L. (Chalmers Tekniska Hoegskola, Goeteborg (Sweden). Jordvaermegruppen). Jun 1982. 25p. (In Swedish). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83750984.

Portions are illegible in microfiche products.

The earth heat system consists of an accumulator, a heat pump, of collectors for charging and the system for heat distribution. Three models have been studied and their applications to different types of houses are discussed. In newly erected apartment houses the earth heat system requires very small incisions in buildings. Energy conservation is calculated to 50-65% and saving of oil to nearly 100%.

49417 (DOE/CH/10122—8) **Guide for commercial water-heating applications.** (ESG, Inc., Atlanta, GA (USA)). Jun 1983. Contract AC02-82CH10122. 120p. NTIS, PC A06/MF A01. Order Number DE83016552.

This document provides technical guidance on methods for reducing water heating costs for small to medium commercial operations. It contains an assessment of three options: conservation measures, waste heat recovery, and solar energy systems. Particular attention is given to solar energy systems, including their installation, economics, and performance monitoring. The material presented is directed toward the commercial owner or user and does not require that he be familiar with the design of equipment. it is applicable to those concerned with laundries, food processing, hotels, motels, and many other users of large volumes of hot water.

49418 (DOE/CS/23337—T2) **Seasonal performance of air conditioners: experimental analysis of some of the DOE test-procedure set-up measurement errors for unitary air conditioners and heat pumps.** Saljnikov, A.V.; Tree, D.R. (Purdue Univ., Lafayette, IN (USA). Ray W. Herrick Labs.). May 1982. Contract AC02-80CS23337. 181p. NTIS, PC A09/MF A01. Order Number DE83016058.

Thesis. Submitted by A.V. Saljnikov.

The DOE test procedure for estimating the seasonal efficiency of air conditioners and heat pumps does not yield repeatable results. The following major sources of that non-repeatability, due to test set-up tolerances are experimentally investigated: (1) heat leakage into the test box both during the on and off time periods of the cyclic test, (2) thermal storage of mass inside the test box, and (3) use of dampers required to prevent forced and free convection over the indoor coil during the off time period of the cyclic test. A 2.5 ton split heat pump in the cooling mode was used in this investigation. In order to study the effect: (1), experiments were performed with different amounts of heat leakage simulated by artificially adding heat into the test box. The effect (2) was investigated by performing the tests under the conditions of low and high thermal mass inside the test box. In order to study the effect (3), some tests were performed with dampers open and with continuous air flowing across the evaporator coil. An analysis was performed over the effects of random measurement error on the uncertainty of the experimental results obtained. The experimental results were analyzed and conclusions were drawn.

49419 **(DOE/CS/23337—T3) Seasonal performance of air conditioners - an analysis of the DOE test procedures: time constants and the performance of a heat pump in the cooling mode.** Offermann, K.W.; Tree, D.R. (Purdue Univ., Lafayette, IN (USA). Ray W. Herrick Labs.). May 1982. Contract AC02-80CS23337. 195p. NTIS, PC A09/MF A01. Order Number DE83016056.

Thesis. Submitted by K.W. Offermann.

A heat pump was tested in the cooling mode under the following conditions: (1) a steady-state test with 95°F (35°C) outdoor temperature, various indoor conditions, and a dry indoor coil; (2) a steady-state test with 82°F (27.8°C) outdoor temperature, various indoor conditions, and a dry indoor coil; (3) a cyclic test with an outdoor room temperature of 82°F (27.8°C), various indoor conditions, and a dry indoor coil. The indoor conditions were varied as follows: (1) indoor temperatures of 75°F (23.9°C), 80°F (26.7°C) and 85°F (29.4°C); (2) volume flowrates over the evaporator coil of 880 cfm (0.47 m^3/s), 1100 cfm (0.52 m^3/s) and 1425 cfm (0.67 m^3/s); (3) during the off-time the dampers were closed in one test series and kept open with a continuously running air handling fan in another test series; (4) the on and off times of the heat pump during the cyclic tests were 6/24 and 10/10 minutes respectively. The purpose of this work was to investigate whether the time-constant method could simplify the present DOE test procedure. Two methods were used to obtain time constants: (1) a curve-fitting method where the time constant could be determined from the best first-order curve fit to the time/temperature curve; (2) a method where an effective time constant was calculated from the area under the time/temperature curve. The first method did not give results comparable to those of the current DOE test procedure. The second method gave the same results as the DOE test procedure but did not ease the testing burden.

49420 **(DOE/CS/23337—T4) Seasonal performance of air conditioners: the effect of frost formation on the performance of a parallel-plate heat exchanger.** O'Neal, D.L.; Tree, D.R. (Purdue Univ., Lafayette, IN (USA). Ray W. Herrick Labs.). Dec 1982. Contract AC02-80CS23337. 187p. NTIS, PC A09/MF A01. Order Number DE83016057.

Thesis. Submitted by D.L. O'Neal.

The frost-formation process and its effect on the performance of a parallel-plate heat exchanger were modeled and experimentally investigated. A frost-growth model was developed which: (1) treated the frost layer as a porous media, (2) incorporated empirical relationships from previous studies for the thermal conductivity and tortuosity as a function of density, and (3) estimated frost growth as a function of time, plate temperature, air temperature, air humidity, Reynolds number, and location on the plate. A heat-exchanger test loop was built and tested to experimentally investigate the frost-formation process and to verify the model. Test conditions were limited to plate temperatures from -12 to -5°C, air-humidity ratios fom 0.00382 to 0.00514 kJ/kg/sub a/, Reynolds numbers from 4400 to 32,400, and air temperatures from 5 to 12°C.

49421 **(DOE/R5/10227—3-Pt.1) Appropriate solarization/conservation technology-development program for the existing housing stock. Final report, Part I.** (Ann Arbor Energy Office, MI (USA)). 1983. Contract FG02-80R510227. 83p. NTIS, PC A05/MF A01. Order Number DE83015823.

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A two year study was conducted by the Ann Arbor Energy Office where five solar/conservation demonstrations were conducted on the homes of low income clients in the city's Community Development Department's Home Rehabilitation Program. The five demonstrations were of the folowing types: thermosyphoning air panels, sunspace/greenhouse applications, direct gain/night insulation, water walls, and major conservation measures.

49422 **(DOE/R5/10227—3-Pt.2) Solarization/Conservation Technology Development Program for existing housing. Part II. Final report.** (Michigan Univ., Ann Arbor (USA). Architectural and Planning Research Lab.). 25 Jul 1983. Contract FG02-80R510227. 82p. NTIS, PC A05/MF A01. Order Number DE83016303.

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In response to the Midwest Appropriate Technology Small Grants Program, researchers at the University of Michigan developed a method for evaluating existing residences for their energy Solarization/Conservation (S/C) potential within the context of the Ann Arbor Community Development Energy Office. A review of climatic conditions, available construction techniques and materials and cost effectiveness, led to initial decisions as to which S/C possibilities were applicable to the given situation. Research, prototypes and comparative testing led to algorithms for computer modelling and reevaluation for application in solar retrofit by the City of Ann Arbor.

49423 **(LBL—14517) New models for analyzing the thermal and daylighting performance of fenestration. Report EEB-W-82-13.** Selkowitz, S.; Winkelmann, F. (Lawrence Berkeley Lab., CA (USA)). May 1983. Contract AC03-76SF00098. 25p. (CONF-821217—7). NTIS, PC A02/MF A01. Order Number DE83016606.

From ASHRAE/DOE conference on thermal performance of building envelopes; Las Vegas, NV, USA (5 Dec 1982).

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Accurate determination of the energy impact of fenestration in nonresidential buildings requires daylighting prediction as well as thermal modeling. Despite the computational power of hour-by-hour simulation programs, they involve trade-offs in accuracy, cost, and flexibility. This paper describes new daylighting and thermal modeling capabilities in DOE-2.1B and planned additions. DOE-2.1B now contains a preprocessor-based daylighting model that is sensitive to daylight availability, site conditions, room and glazing parameters, window mangement for glare and solar control, and lighting controls. To model more complex designs, the next version of the DOE-2.1 program will have a daylighting model based on stored or user-input coefficients of utilization. A lighting program, named SUPERLITE, provides detailed data on illuminance and luminance distribution throughout interior spaces. Because the solar gains through sophisticated daylighting designs are not now adequately calculated, a procedure based on a library of new heat-gain coefficients is being developed. Using sun and sky simulators, these coefficients will be determined from direct measurements of solar optical properties of architectural devices. The major experimental procedures and analytical models, along with validation studies of DOE-2.1B and SUPERLITE and sample results from these new modeling tools, are described.

49424 **(LBL—14788-Rev.) Monitored low-energy houses in North America and Europe: a compilation and economic analysis.** Ribot, J.C.; Rosenfeld, A.H.; Flouquet, F.; Luehrsen, W. (Lawrence Berkeley Lab., CA (USA)). Mar 1983. Contract AC03-76SF00098. 19p. (CONF-820849—8-Rev.). NTIS, PC A02/MF A01. Order Number DE83016108.

From Summer study in energy efficient buildings; Santa Cruz, CA, USA (22 Aug 1982).

In the Building Energy-Use Compilation and Analysis (BECA) project, Part A (New homes), 215 submetered, energy-efficient residential buildings (including 7 small multi-family buildings comprising 68 single-family units) were analyzed. The energy use of these buildings was compared, normalized to an indoor temperature of 20°C. The average thermal integrity of these buildings is 53 kJ/m^2DDC. Only 29 buildings have submetering adequate to permit normalizing space heating loads for both indoor temperature and internal gains. The average standard thermal integrity of these 29 buildings is 46 kJ/m^2DDC. These compare favorably to US 1979 building practice of 100 kJ/m^2DDC and US Stock at 180 kJ/m^2DDC. Data on the added first cost of conservation measures for 92 buildings were obtained. Of these buildings, the only homes that have costs of conserved energy below current energy costs are those with superinsulation, either alone for combined with low-aperture, passive-solar design.

49425 **(LBL—15297) Energy & Environment Division annual report. Energy-Efficient Buildings Program, FY 1982.** Cairns, E.J.; Rosenfeld, A.H. (Lawrence Berkeley Lab., CA (USA)). Mar 1983. Contract AC03-76SF00098. 85p. NTIS, PC A05/MF A01. Order Number DE83015013.

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Progress is reported on the following research projects: energy performance of buildings, building ventilation and indoor air quality, windows and daylighting, lighting systems, building energy data, and building energy simulation. (MHR)

49426 **(LBL—15299) Energy Analysis Program annual report, FY 1982.** (Lawrence Berkeley Lab., CA (USA)). Mar 1983. Contract AC03-76SF00098. 58p. NTIS, PC A04/MF A01. Order Number DE83011939.

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Progress is reported on the following research projects: residential energy conservation; developing a guide for homebuilders; the effect of window size and orientation on heating and cooling loads in residential houses; climate analysis in support of the homebuilders guide; determination of the seasonal coefficient of performance of conventional air source heat pumps in residential buildings; energy efficiency in Chinese buildings; occupant behavior and residential energy use; energy conservation in public housing; simplified energy analysis methodology for commercial buildings; estimates of residential energy savings from proposed federal policies for appliances; cost/efficiency tradeoffs in the residential appliance marketplace; heat pump energy demand analysis; utility conservation programs: theory and practices; residential hourly and peak demand model; and international progress in residential energy efficiency. (MHR)

49427 **(LBL—15376) Ventilation efficiencies of wall- or window-mounted residential air-to-air heat exchangers.** Offermann, F.J.; Fisk, W.J.; Grimsrud, D.T.; Pedersen, B.; Revzan, K.L. (Lawrence Berkeley Lab., CA (USA)). May 1983. Contract AC03-76SF00098. 28p. (CONF-830640—8). NTIS, PC A03/MF A01. Order Number DE83015936.

From ASHRAE conference; Washington, DC, USA (26 Jun 1983).

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Mechanical ventilation systems with air-to-air heat exchangers can be installed into residences to provide energy-efficient supplementary ventilation for the purpose of controlling indoor concentrations of contaminants, odors, and moisture. Wall- or window-mounted units have become particularly attractive because they are relatively inexpensive and easy to install. However, because they lack an air-distribution system, concern has arisen over their ventilation performance. To address this concern, a series of experiments was conducted on two different models of wall- or window-mounted heat exchangers in two multi-room research facilities. The nominal ventilation efficiencies of these units have been determined by measurement of tracer-gas decay rates at several indoor locations to be in the range of 0.44 to 0.65. No significant correlations between nominal ventilation efficiency and heat exchanger model or operational strategies were observed. Significantly higher local ventilation efficiencies were noted in the rooms where the heat exchangers were operating. Some preliminary tests indicate that internal leakage between the airstreams contributes significantly to the ventilation inefficiency of these systems.

49428 **(LBL—16126) Optimal cogeneration systems for high-rise office buildings.** Eto, J.H. (Lawrence Berkeley Lab., CA (USA)). May 1983. Contract AC03-76SF00098. 9p. (CONF-830812—38). NTIS, PC A02/MF A01. Order Number DE83015953.

From 18. intersociety energy conversion engineering conference; Orlando, FL, USA (21 Aug 1983).

Alternative cogeneration plant configurations and operating strategies are examined with the use of DOE-2 computer simulations and net present value economic analyses to determine optimal cogeneration systems for high-rise office buildings. The examination takes the form of a case study for a hypothetical office building located in San Francisco, California, where a new regulatory attitude toward grid interconnection for cogenerators has begun to emerge. The conclusion of the study is that, under current economic conditions, the optimal cogeneration system is an internal combustion engine sized well-below the electrical requirements of the building and operated so that most of the by-product heat recovered is utilized. Notably, most of the systems fail to meet the efficiency requirement upon which receipt of the regulatory and economic benefits is predicated.

49429 **(LBL—16322) Survey of end-use metering in the United States.** Vine, E.L. (Lawrence Berkeley Lab., CA (USA)). Jun 1983. Contract AC03-76SF00098. 67p. NTIS, PC A04/MF A01. Order Number DE83016617.

The results of a survey of metering studies of space heating, space cooling, and water heating in the United States since 1970 are presented. Also present in this paper is a questionnaire that is to be used in a survey of households that have been metered for space heating and/or air conditioning. The questionnaire contains questions on occupants' attitudes, behavior, billing, and building data.

49430 **(NYSERDA—83-9) Community demonstration of aerial-thermography techniques.** (Calspan Corp., Buffalo, NY (USA)). Aug 1982. Contract W-7405-ENG-26. 101p. (ORNL/Sub—9001/2). NTIS, PC A06/MF A01. Order Number DE83016689.

The results of a demonstration which applied the advanced aerial thermography techniques developed in previous projects to the three New York State communities of Plattsburgh, Fairport and Arcade. A major objective of this effort was to determine the accuracy of conventional and advanced aerial thermography techniques in determining relative roof top heat loss. Additionally, the study developed a methodology for dissemination of quantitative data obtained from aerial thermograms. The results of the study confirm that advanced aerial thermography techniques are significantly more accurate and reliable than conventional thermography in determining relative roof top heat loss. The advanced thermography techniques were able to define five discernible heat loss levels for roofs and to identify the heat loss level of each roof to within one level 99% of the time. This compared favorably to conventional thermography, which resulted in significant identification errors 21% of the time.

49431 **(ORNL/CON—125) Design options to test the effects of financial incentives in a utility conservation program: TVA's heat-pump water-heater program.** Berry, L.; Tsao, H.; Hirst, E. (Oak Ridge National Lab., TN (USA)). Aug 1983. Contract W-7405-ENG-26. 88p. NTIS, PC A05/MF A01. Order Number DE83016344.

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Several experimental designs and analysis techniques are described and assessed. Using TVA's Heat Pump Water Heater Program as a carrier, it addresses questions related to financial incentives such as: (1) Do TVA residential customers prefer loans or rebates. (2) What is the incremental effect of financial incentives on conservation investments relative to information-only programs. How does the effect vary with increases in the incentive. (3) How do users of financial incentives differ from nonusers. The five design alternatives include both household level and distributor level data collection and analysis. The designs are: (1) random assignment of households to treatments within distributors with matching; (2) random assignment of households to treatments within distributors without matching; (3) random assignment of treatments at the distributor level; (4) random assignment of households to treatments within distributors that are randomly selected from matched blocks of distributors (combination of designs 2 and 3); and (5) nonrandomized design that uses whatever data are available. These methods are assessed in terms of administrative difficulties, strength of conclusions (both internal and external validity), and the costs of data collection and analysis.

49432 **(PB—83-178673) Radisson community heating systems: technical and economic comparison of options. Final report.** Lester, W.A.; Becker, R.D.; Funnell, J.H.; Cardinal, R.A. (O'Brien and Gere Engineers, Inc., Syracuse, NY (USA)). Dec 1981. 133p. NTIS, PC A07/MF A01.

The project compared the energy savings and total costs of various water source heat pump systems (including advanced community systems) with both a conventional gas furnace and an air source heat pump for 21 new houses to be built at Radisson, a planned community near Syracuse, sponsored by the Urban Development Corporation. Present capital equipment costs and gas/electricity prices were used in the study, as well as estimates for the general inflation rate and gas/electricity inflation rates in order to

calculate energy and total life cycle costs for all heating system options. At current prices, it was found that only an engine-driven central water source heat pump was more economic to operate than a gas furnace. Of the electric options examined, water source individual heat pumps used the least power, while standard individual air source heat pumps used the most.

49433 **(PB—83-182071) Investigation of coupled simulation methods for North Dakota space heating-cooling scenarios using groundwater. Technical completion report Jan 81-Sep 82.** Busby, H.R.; Rieder, W.G. (North Dakota Water Resources Research Inst., Fargo (USA)). Aug 1982. 127p. NTIS, PC A07/MF A01.

An investigation of thermal-reservoir simulation methods was aimed at finding a package which would be locally appropriate for shallow aquifers and coupled above-grade space heating-cooling systems. A combination of information solicitations, algorithm tests, literature surveys, and existing code reviews showed that most available codes were overly sophisticated relative to the original constraints established for local use. Available codes also tended to have common shortcomings in treating temperature-dispersion, thermal property-uncertainty, and buoyancy effects. As a consequence several small, streamlined, simulator codes were set up by using composites of existing programs; and validation tests were started. Both finite element and finite difference (Marker cell) methodologies were incorporated. From these the one having fewest limitations, a two-dimensional (pseudo three dimensional) marker-cell simulator, is presented along with a description of use limitations.

49434 **(PB—83-185330) Energy conservation for housing: a workbook.** (Ehrenkrantz Group, Washington, DC (USA); Perkins and Will, Inc., Washington, DC (USA)). May 1982. 319p. NTIS, PC A14/MF A01.

Multifamily housing project managers can reduce their energy costs from 30 to 60 percent by capitalizing on a variety of energy conservation opportunities (ECO's) identified in HUD research on the physical condition of public housing stock. This workbook prepares managers for this planning and for making individualized energy audits. It provides all the materials they need to proceed, including analysis sheets for calculating costs - benefit and payback periods for each of the 50 ECO's described. The ECO's listed fall into four general categories: architectural improvements to the energy design of the building envelope; heating system ECO's to increase energy efficiency; secondary ECO's related to the domestic water supply, air conditioning systems, and central laundry equipment; and electric system ECO's reducing utility surcharges and increasing light bulb efficiency. Managers can add to the list of 50 ECO's as they conduct a significant part of their energy audit: the walkthrough survey. The survey entails inspecting all buildings, equipment rooms, and dwelling units to gather qualitative data on energy status. ECO's can be as simple as caulking doors and windows and installing energy efficient shower heads. After completing their walkthrough, managers can use the workbook's utility forms, which help in choosing specifications of products or building components that work best with existing structures and determining the appropriate manufacturer to approach for cost estimates. The workbook also includes summary sheets for recording final results of ECO's, a glossary of terms, climate data for various project sites (solar factors, hours of heating season, heating degree), and a 30 - item bibliography.

49435 **(PB—83-185348) Performance analysis of the Jersey City total energy site: final report.** Hurley, C.W.; Ryan, J.D.; Phillips, C.W. (National Bureau of Standards, Washington, DC (USA). Center for Building Technology). Aug 1982. 408p. (NBSIR—82/2474.). NTIS, PC A18/MF A01.

The National Bureau of Standards (NBS) gathered engineering, economic, environmental, and reliability data from a 486 - unit apartment / commercial complex located on a 6.35 - acre site in Jersey City, N.J. The complex was designed to recover waste heat from diesel engines to make the central equipment building a total energy (TE) plant. The TE plant has been serving the complex since January 1974. NBS designed and installed the instrumentation and a data acquisition system (DAS) to determine fundamental engineering data from the plant and site buildings. This report describes these systems and presents the appropriate data and a performance analysis of the plant and site. Analysis of the data indicates that a significant savings in fuel is possible by minor modifications in plant procedures. The report also includes the results of an analysis of the quality of utility services supplied to the consumers on the site and an analysis of a series of environmental tests made for the effects of the plant on air quality and noise. In general, these analyses reflected favorable results for the TE plant. Economic and energy analyses are presented for the plant as operated during the study period and on a comparative basis with 12 alternative system designs applicable for providing the tenants on the site with equivalent utility services. In general, although those systems utilizing the TE concept showed a significant savings in fuel, such systems do not represent attractive investments compared to conventional systems, with fuel costs of 1977. Chapter references, tables, figures, photographs, and appended technical data are provided. (Author abstract modified).

49436 **(PB—83-185355) Performance analysis of the Jersey City total energy site: executive summary.** Hurley, C.W.; Ryan, J.D. (National Bureau of Standards, Washington, DC (USA). Center for Building Technology). Mar 1982. 60p. (NBSIR—82/2483). NTIS, PC A04/MF A01.

Engineering and economic data were gathered from an apartment / commercial complex in Jersey City, N.J., that was designed as a total energy plant using absorption type chillers. HUD designed the central equipment building to produce both the thermal and electrical energy required by the site and to install the equipment necessary to recover waste heat from the diesel engines driving the generators. Engineering data analysis indicates a significant savings in fuel by using the total energy concept. Services were supplied to consumers at an acceptable level within the reliability targets set and achieved by many utility companies. Nitrogen oxides were the only detectable combustion pollutants from the plant. However, given the existing high background of nitrogen oxide levels in the area, the plant's contribution could be classified as incremental. The noise level was below the daytime local noise ordinances at the buildings adjacent to the plant. Environmental effects of the cooling tower were well within acceptable limits. Other alternative systems using the total energy concept showed a significant savings in fuel, but these systems' economics were marginal compared to conventional systems based on 1977 - 78 economics. The report identifies several areas where minor modifications in plant operations could save fuel. Data tables and photographs are included.

49437 **(PB—83-185884) Investigation of mobile homes for air conditioning and heating performance: evaluation of Zone 1 mobile home thermal envelopes. Report.** Ingley, H.A.; Dixon, R. (Florida Univ., Gainesville (USA). Solar Energy Lab.). Jul 1981. 126p. NTIS, PC A07/MF A01.

This report presents an evaluation of Zone 1 full - size mobile home winter - spring thermal envelopes. The task involved an experimental analysis of day and night thermal performance evaluation of these homes for compliance with HUD Mobile Home Standards Subparts F and H '3'. Existing instrumentation installed in the two HUD - provided mobile homes was modified in order to conduct winter - spring testing on the mobile homes' furnace air delivery, fuel supply, and thermal envelope. The experimental parameters manifested during this phase included climate conditions; interior temperatures; interior humidity; heat flow through walls, ceiling, and floor; condensation in the internal structure; infiltration rates; and energy consumption of the heating equipment. These data were subsequently used to analyze the thermal performance of the mobile home envelope and the energy consumption associated with conditioning the interior space. Also presented are the results of an evaluation of the effects of improved insulation and vapor barrier strategies on thermal performance and condensation, the impact of transportation on thermal performance, and evaluations of four selected shading devices. Study data, figures, and four references are provided.

49438 **(PB—83-185934) Energy consumption impacts of site tailoring of mobile homes for energy efficiency. Topical report.** (Science Applications, Inc., McLean, VA (USA)). 21 Jul 1981. 30p. NTIS, PC A03/MF A01.

Tables present data illustrating the results of the test performance of sealed insulating glass correlated with its actual long - life performance in the field. The E6P3 is the standard specifying levels of test performance for the glass that is used to compare test performance with actual performance in numerous housing units across the country. Frost point measurement is the control for performance. Data indicate that units in the survey ranging from 2 - 5 years old continue to perform well, with 95 percent maintaining frost points colder than -50 degrees F. Frost points differed across E6P3 classes. Overall, units supplied by manufacturers who subject themselves to two unannounced inspections and a yearly test for certification will perform well in the field. Tables form the bulk of the report.

49439 **(PB—83-185942) Sensitivity analysis of mobile home space conditioning energy requirements to selection of U-values in twelve climates and cost/benefit analysis of U-values proposed for the federal manufactured housing construction (FMHC) and safety standards (SS).** (Science Applications, Inc., McLean, VA (USA)). 25 Sep 1981. 91p. NTIS, PC A05/MF A01.

This study determines the sensitivity of four suggested and existing building thermal performance standards to mobile home heating and cooling loads and to the seasonal energy consumption of the equipment meeting these loads. It also evaluates the net costs and benefits of an Office of Mobile Home Standards proposal to increase the level of stringency of the present regulation. Three mobile homes, each representing typical single - wide and double - wide homes, were selected to be simulated for 12 cities. The thermal resistance of the wall, roof, floor, door, and window components of the thermal envelope were chosen to reflect both common or potential construction methods and to obtain the overall U - value levels required by each standard level. The "Hot House" program was selected to determine seasonal energy consumption. Results indicate that seasonal loads decrease with decreasing U - values, although in some cases a decrease U - value resulted in a slight increase in the seasonal cooling load. The best standards for thermal performance and U - values are noted, as are sults of the cost - benefit analysis. Tables, eight references, and a "Hot House" program listing are included.

49440 **(PB—83-186064) Energy conserving features inherent in older homes.** Burns, J.A. (Acorn Structures, Inc., Concord, MA (USA); Department of Housing and Urban Development, Washington, DC (USA). Building Technology Div.). 1982. 43p. NTIS MF A01.

This publication identifies energy saving features most commonly found in houses built prior to 1920. The reuse of original energy - conserving features in a house is sympathetic rehabilitation. The philosophy of sympathetic rehabilitation is that there are cost - effective alternatives to stripping a house to its base structure and installing all new mechanical systems and finishes. Many of the architectural features of these older homes can serve as passive energy - saving devices if their uses are understood. Sympathetic rehabilitation can provide cost - effective energy conservation in older homes without destroying historical integrity. Numerous photographs and drawings illustrate energy - conscious design features such as site orientation, thick walls, color, window size, location of openings, shutters, light wells, roof overhangs, high ceilings, chimneys, skylights, and warm air flues. A total of 24 references are included.

49441 **(PB—83-186072) Applying the cost-effective energy standards in rehabilitation projects.** (Dialogue Systems, Inc., New York (USA)). Sep 1982. 63p. NTIS, PC A04/MF A01.

The guide explains to local Community Development managers and others how to apply HUD's Cost Effective Energy Conservation Standards (CEECS) to properties they rehabilitate. It explains what the CEECS require in terms of energy conservation measures and the procedures for calculating cost - effectiveness for both single - family and multifamily buildings. Requirements for all buildings include weatherstripping, caulking, and, when replacing heating, ventilation, and air conditioning systems, insulation of supply and return pipes and ducts in unconditioned spaces. The step - by - step method for calculating cost - effectiveness of conservation measures requires identification and consideration of the fuel consumption over the life of the improvement, rate of heat loss from building, number of heating days and cooling hours, heating value of fuel, and other values. Enclosed charts can be used to calculate the variables. An energy audit questionnaire and worksheets are also provided. The various HUD rehabilitation programs in which the CEECS are required include the Section 312 Rehabilitation Loan program, the Community Development Block Grant program, Section 203 (k) Home Mortgage Insurance program, Section 8 Substantial Rehabilitation Program, and the Flexible Subsidy program. Tables; forms, including an energy audit questionnaire; a glossary of terms; and a list of HUD area offices are provided.

49442 **(PNL-SA—10977) Economics of commercial building energy-conservation standards.** Heidell, J.A.; King, M.J.; Skumatz, L.A. (Pacific Northwest Lab., Richland, WA (USA)). Jul 1983. Contract AC06-76RL01830. 17p. (CONF-830773—3). NTIS, PC A02/MF A01. Order Number DE83016783.

From 58. Western Economic Association annual conference; Seattle, WA, USA (20 Jul 1983).

Some of the pragmatic issues, methodology, and results of intervention into the private market via recommendations for building energy conservation standards are examined. Many of the theoretical aspects are bypassed in favor of examining the economic and energy implications. The arguments for and against intervention are examined first, and second, the approach and results of an effort to develop commercial building energy conservation standards are discussed.

49443 **(PNL-SA—11392) Residential energy use and improved building thermal efficiency: an econometric analysis.** Moe, R.J.; Owzarski, S.L.; Streit, L.P. (Pacific Northwest Lab., Richland, WA (USA)). Jun 1983. Contract AC06-76RL01830. 23p. (CONF-830696—3). NTIS, PC A02/MF A01. Order Number DE83016245.

From ORSA-TIMS conference; Washington, DC, USA (7 Jun 1983).

An analytical framework is applied to the case of increases in residential building thermal efficiency. Econometric estimates of the effects of increases in thermal efficiency on winter space heating electricity consumption in the Pacific Northwest are provided, as are estimates of the benefits to consumers of such increases. The paper is divided into four sections: the theoretical framework, implementation of the theory, the statistical results, and a summary. (MHR)

49444 **The applicability of energy models to occupied houses: summer electric use in Davis.** Vine, E.L.; Craig, P.P.; Cramer, J.C.; Dietz, T.M.; Hackett, B.M.; Kowalczyk, D.J.; Levine, M.D. (Energy and Environment Division, Lawrence Berkeley Laboratory, Berkeley, CA 94720). *Energy (Stamford, Connecticut);* 7: No. 11, 909-926(Nov 1982). Contract AC03-76SF00098.

Total electricity use and cooling loads for a three month cooling season (July-September, 1980) in single-family detached houses in Davis, California, are estimated and compared with measured data. Total electricity use is estimated by predicting cooling loads and appliance electricity use using a technique approximating a relatively low cost audit program. Cooling loads are estimated using an interpolation model to simplify application of the DOE-2.1A energy use computer model. Appliance electricity use is derived from manufacturers' data, and patterns of appliance use are elicited from occupants through a survey. While reasonably accurate prediction of aggregate electricity use and cooling load for a group of houses is possible, similar accuracy for individual houses is more difficult because of variation and uncertainty in occupant behavior patterns and building parameters. The authors conclude that precise forecasting of individual house electricity use is unlikely, even when there are no changes in occupancy, unless impracticably expensive monitoring techniques are employed.

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REFER ALSO TO CITATION(S) 49261, 49461

49446 **(AD-A—126449/8) Potential fuel savings of specific ATC system improvements. Final report.** Rucker, R.A. (Mitre Corp., McLean, VA (USA). METREK Div.; Federal Aviation Administration, Washington, DC (USA). Office of Systems Engineering Management). Feb 1982. 185p. (MTR—81W275). NTIS, PC A09/MF A01.

Procedural restrictions are often imposed by the current ATC system upon the choice of routes and altitudes that the airspace user may fly. ATC-imposed delays before departure, while en route, or before landing are also a common experience. To the extent that such restictions and delays impose fuel or time penalties, they are of concern to today's fuel/cost conscious airspace user. To the extent they are needed to resolve actual conflicts between aircraft competing for the use of common air-spaces or runways, they are essential for maintaining air safety. However, to the extent that they simply 'separate aircraft from otherwise empty airspace or runways', they impose unnecessary and costly penalties on the airspace users. This report analyses the results of two recent FAA studies of these problems and also presents some previously unpublished case studies in attempt to better understand the causes and consequences of specific restrictions and delays to IFR flight movements. The report also estimates the potential for fuel savings if the ATC system could be improved to the point where only those restrictions and delays actually needed to insure flight safety are actually imposed. These potential fuel savings are allocated as the estimated benefits of five specific ATC system functional improvements now being considered by the FAA.

49448 **(AD-A—127422/4) Fuel conservation evaluation of US (United States) Army helicopters. Part 4. OH-58C flight testing. Final report 22 Sep 20-Nov 82.** Belte, D.; Stratton, M.V. (Army Aviation Engineering Flight Activity, Edwards AFB, CA (USA)). Aug 1982. 82p. NTIS, PC A05/MF A01.

The United States Army Aviation Engineering Flight Activity conducted level flight performance tests of the OH-58C helicopter at Edwards AFB, California from 22 September to 20 November 1981, and at St. Paul, Minnesota, from 12 January to 9 February 1982. Nondimensional methods were used to identify effects of compressibility and blade stall on performance, and increased referred rotor speeds were used to supplement the range of currently available level flight data. Maximum differences in nondimensional power required attributed to compressibility effects varied from 6.5 to 11%. However, high actual rotor speed at a given condition can result in less power required than at low rotor speed even with the compressibility penalty. The power required characteristics determined by these tests can be combined with engine performance to determine the most fuel efficient operating conditions.

49447 **(DFVLR-FB—82-18) Effects on traffic of a magnetic levitation system Frankfurt -96 Paris.** Schmitt, A.; Keimel, H.; Wuerdemann, G.; Halten, W. (Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt e.V., Koeln (Germany, F.R.)). 1982. 371p. (In German). NTIS (US Sales Only), PC A16/MF A01. Order Number DE83751103.

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The study is based on an analysis and forecast of the volume and structure of passenger travel in the region under consideration for a situation without a Maglev system. For the case with a Maglev line Frankfurt-Paris, both the substitutional effects of this system on the travel demand of aeroplane, train and car and the newly generated traffic are estimated. As a result for 1990 a total of 6.6 million passenger trips per year on the Maglev system is expected, most of these (c. 60%) coming from original passenger train traffic. On account of feeder services to the Maglev system, demand for the existing rail system (in passenger kilometers) is diminished by only 20%. 15-20% of the total demand for the Maglev system between Frankfurt and Paris is estimated to originate from O-D-air-travel in the corridor (which is supposed to be totally substitutionable) and another 10-15% both from substituted car travel and from newly generated travel. Balances are struck for travel cost, travel time, and trip kilometers spent in the without- and with-case. Sensitivity analysis have been carried out for supply variants of the Maglev system and the classic rail system. Beside the study method there are some statements regarding inspected travel market shares which are supposed to be transferable to other planning cases.

49448 **(DOE/CS/50115—T31) Transportation energy alternatives: implementation strategies. Final report.** Dickson, E.M.; Freeman, T.A.; Conley, D.E.; Scott-Walton, B.L. (SRI International, Menlo Park, CA (USA). Center for Resource and Environmental Systems Studies). Jun 1980. Contract AT03-76CS50115. 272p. NTIS, PC A12/MF A01. Order Number DE83016087.

Research findings are analyzed to determine the extent to which synfuels, electric vehicles, and railroad electrification may displace petroleum-based fuels by the year 2000. The technology impact assessment also includes concerns relative to ecological, biological and socioeconomic factors. Constraints on deployment of the technology are discussed relative to national energy policy. (PSB)

49449 **(NP—3770324) Hierarchical system to control traffic flow on highways.** Papageorgiou, M. (Technische Univ. Muenchen (Germany, F.R.). Fakultaet fuer Elektrotechnik). 15 Apr 1981. 192p. (In German). NTIS (US Sales Only), PC A09/MF A01. Order Number DE83770324.

Portions are illegible in microfiche products; Thesis.

A multi-layer concept with decentralized direct control layer is suited for a sub-optimal control of a class of large systems. One can obtain a robust, stable, current-insensitive and sub-optimal controller behaviour after a detailed problem specification of the controller layers, that can be applied to the problem of traffic control on highways.

3203 Industry And Agriculture

REFER ALSO TO CITATION(S) 48538, 48539, 48786, 49455

49450 **(CONF-760736—) Energy Research and Development Administration workshop on energy conservation in agricultural production.** (Washington Scientific Marketing, Inc., DC (USA)). 1976. 98p. NTIS, PC A05/MF A01.

From Energy Research and Development Administration workshop on energy conservation in agricultural production; Washington, DC, USA (15 Jul 1976).

Participants are listed and the chairman's summary remarks are presented for the following workshop groups; crop production systems, animal production systems, greenhouses and other production systems, on-farm processing, water resources, and utilization of agricultural by-products. All recommended projects are listed by title and reference number. (MHR)

49451 **(DOE/CS/40402—T3) Assessment of private-sector cogeneration models.** (Energetics, Inc., Columbia, MD (USA)). Jul 1983. Contract AC01-80CS40402. 49p. NTIS, PC A03/MF A01. Order Number DE83016377.

The merits of four cogeneration models were identified, characterized, and evaluated. The models selected were: Pacific Gas and Electric (PG and E) Cogeneration Financial Analysis Models; Electric Power Research Institute (EPRI) Computer Program for Evaluation of Dual Energy Use System (DEUS model); the National Energy Software Center - Argonne National Laboratory Industrial Cogeneration Project (ICOP) Model; and Energetics, Inc. Cogeneration Financial Model (COGEN). Work with the DEUS model was restricted to a qualitative evaluation. The strengths and weaknesses of each of the four models are described in qualitative terms. The characteristics of each of the six test cases are described. The results of the six cases using the PG and E, ICOP, and COGEN models are discussed in detail and compared. (MHR)

49452 **(DOE/EI/19618—T1) Ohio No. 2 fuel oil price-monitoring survey, 1982-1983 heating season. Final report.** Karas, J.E. (Karas (James E.), Columbus, OH (USA)). 31 May 1983. Contract FG01-82EI19618. 42p. NTIS MF A01. Order Number DE83016543.

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A random monthly telephone survey of 55 No. 2 fuel oil retailers by the Ohio Division of Energy (ODOE) yielded an average price of $1.119 par gallon for the 1982-83 heating season, 2.7% lower than last year. Recommendations to improve the survey design include streamlining oil companies' reporting requirements, expanding the dissemination of price information, and increasing the amount of data collected. The No. 2 distillate fuel oil market in Ohio is experiencing adequate supply, decreasing or stabilizing prices, and declining demand. The No. 2 average price in Ohio is forecast to decline by 0.3 to 4.9% during the upcoming year, ranging from $1.069 to $1.121 per gallon by second quarter 1984.

49453 **(DOE/NBM—3016469) Economic thickness for industrial insulation.** (Department of Energy, Washington, DC (USA). Office of Industrial Programs). 1983. 199p. NTIS, PC A09/MF A01. Order Number DE83016469.

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This manual is presented in 8 chapters plus appendices. Chapters 1 and 2 are included as background information. The economic insulation thickness is found using the following chapters: Chapter 3, cost of energy (heat and refrigeration); Chapter 4, cost of insulation, and Chapter 5, economic thickness determination. Each of these chapters contains a worksheet, which provides a step-by-step procedure for solving the problem. Nomographs are included in each section for simplifying the required calculations. For subambient temperature systems, the economic insulation thickness calculated with Chapters 3 to 5 should be compared to the thickness required to prevent condensation (sweating), as calculated with Chapter 6. Chapter 7 presents the procedure for calculating economic insulation for retrofit situations. Sample problems are included in Chapter 8.

3206 Municipalities And Community Systems

REFER ALSO TO CITATION(S) 48773, 49273, 49274, 49275, 49276, 49277, 49278, 49279, 49280, 49281, 49444

49454 **(DOE/CE/15095—2) Wastes to resources: appropriate technologies for sewage treatment and conversion.** Anderson, S.P. (National Center for Appropriate Technology, Butte, MT (USA)). Jul 1983. Contract AC01-82CE15095. 30p. NTIS, PC A03/MF A01. Order Number DE83015398.

Background information is presented on sewage treatment in the US and the key issues facing municipal sewage managers. Conventional sewage treatment systems are outlined and alternative and innovation technologies are introduced. Case studies present the experiences of five municipal systems: the technologies involved, the costs, the project problems and subsequent solutions, the energy considerations, and the current status of each project. Some of the lessons learned and future possibilities for the application of appropriate technologies to sewage treatment and conversion are reviewed. Each chapter includes a glossary and abbreviation list, reference sources, and a list of agencies and people who can provide further assistance. (MHK)

49455 **(DOE/PE/70042—1) Potential for industrial cogeneration development to defer new-utility electric-power capacity over the next decade.** (Resource Planning Associates, Inc., Cambridge, MA (USA)). Jun 1983. Contract AC01-79PE70042. 126p. NTIS, PC A07/MF A01. Order Number DE83016643.

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Selected utilities in different geographic areas were interviewed to determine the criteria under which they would defer the initiation or completion of central station power plants (essentially, new coal plants) due to projected industrial cogeneration capacity. Using these criteria for the period 1983 to 1993, projected new industrial cogeneration in 28 National Electric Reliability. Council sub-regions was assessed against planned new capacity by all the nation's utilities. Further analysis and discussion with utilities in potentially affected regions revealed that only three sub-regions, Middle South Utilities, Gulf States Utilities, and the Texas System, might experience deferrals due to cogeneration. The projected increment of new cogeneration capacity for the period 1983 to 1993 for these three regions is 2720 MW, which is 3% of the 87,000 MW of new coal plants that utilities in the US plan to bring on line in the next decade. In the three sub-regions the projected cogeneration increment for the ten-year period is 15% of the new capacity (18,000 MW) that utilities have planned. To carry out the study, detailed projections were made of new increments of industrial cogeneration capacity for the five major energy-using industries. It was concluded that about 11,000 MW of new cogeneration capacity could come on line in the period 1983 to 1993.

3209 Education And Public Relations

REFER ALSO TO CITATION(S) 49259

49456 (CONF-830229—, pp 405-412) **Investigation of the effects of windows and lighting in offices.** Wotton, E. (Lighting Consultant and Designer, Toronto, Ontario); Barkow, B. 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

This study investigates the effects of windows and lighting on the performance and well being of office workers. Data was collected by means of structured interviews with 235 managerial and clerical staff in six office buildings located in Toronto and Hamilton. The buildings had a range of window glazing from 11% to 68%. The respondents had desk locations near and far from a window. Illuminance measurements were also made. Responses to the interviews were analyzed and conclusions drawn.

49457 (CONF-830229—, pp 415-418) **Human response to daylighting in the therapeutic environment.** Verderber, S. (Univ. of Houston, TX). 1983. NTIS, PC A18/MF A01.

From International daylighting conference; Phoenix, AZ, USA (16 Feb 1983).

A subset of results is reported from an empirical investigation on human response to key functions of the window. Daylighting was found to be one of an array of twenty cognitive dimensions of windowness in the therapeutic environment. The research was carried out in six hospital-based rehabilitation units in Chicago. Non-metric multidimensional scaling was utilized to distinguish an underlying conceptual structure. Among the findings, therapy treatment rooms whose windows allow for daylight penetration are perceived as desirable by patients and staff alike. Respondents ascribed highest preference levels for dimensions whose contents addressed interesting views that allow one to reach out onto life beyond the hospital. Daylighting was of second highest priority whereas, on the opposing end of the spectrum, dimensions labeled Architectural Windowlessness and Psychological Windowlessness denoted conditions characterized by a complete lack of daylight transmission and total dependence on artificial illumination; these indices were little-preferred. The architecture of health care must carefully reassess the human dimensions of view and daylighting relative to emerging energy-conscious daylighting strategies.

33 ADVANCED AUTOMOTIVE PROPULSION SYSTEMS

3301 Internal Combustion Engines

REFER ALSO TO CITATION(S) 49463, 49463

49458 **(AD-A—128837/2) Compatibility study of anti-misting kerosene and the DC-10/KC fuel system. Final report Mar 81-Apr 82.** Ching, F.Y.; Peacock, A.T. (McDonnell Douglas Corp., Long Beach, CA (USA); Federal Aviation Administration, Atlantic City, NJ (USA). Technical Center). Mar 1983. 111p. NTIS, PC A06/MF A01.

The compatibility of antimisting kerosene (AMK) with a contemporary fuel system was evaluated. AMK made with the FM-9 additive to the base fuel was used throughout the program. Tests were conducted to determine AMK effects on components and system performance, and component and system effects on the fuel. Some DC-10/KC-10 systems are incompatible with the AMK fuel. Systems and/or procedural revisions to accommodate the AMK do not appear to present technically insurmountable problems. AMK reduces the performance of some systems (e.g., jet pump transfer, gravity transfer, and suction feed) below normally accepted levels. Extensive study and testing will be required to certify the aircraft fuel system for use with the FM-9 AMK.

3303 Electric-powered Systems

49459 **(DOE/CS/54209—12) Vehicle test report: South Coast Technology electric Volkswagen Rabbit with developmental low-power armature chopper.** Marte, J.E.; Bryant, J.A.; Livingston, R. (Jet Propulsion Lab., Pasadena, CA (USA)). Jun 1983. Contract AI01-78CS54209. 56p. NTIS, PC A04/MF A01. Order Number DE83015658.

Dynamometer performance of a South Coast Technology electric conversion of a Volkswagen (VW) Rabbit designated SCT-8 was tested. The SCT-8 vehicle was fitted with a transistorized chopper in the motor armature circuit to supplement the standard motor speed control via field weakening. The armature chopper allowed speed control below the motor base speed. This low speed control was intended to reduce energy loss at idle during stop-and-go traffic; to eliminate the need for using the clutch below base motor speed; and to improve the drivability. Test results indicate an improvement of about 3.5% in battery energy economy for the SAE J227a-D driving cycle and 6% for the C-cycle with only a minor reduction in acceleration performance. A further reduction of about 6% would be impossible if provision were made for shutting down field power during the idle phases of the driving cycles. Drivability of the vehicle equipped with armature chopper was significantly improved compared with the standard SCT Electric Rabbit.

49460 **(SAND—83-1216C) Tubular battery and transistorized controller outdoor laboratory test program.** Bassett, R.R.; Barnaby, B.E. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 18p. (CONF-830783—1). NTIS, PC A02/MF A01. Order Number DE83016231.

From Battery user's workshop; Washington, DC, USA (20 Jul 1983).

Aerospace Corporation contracted with Sandia National Laboratories to evaluate tubular batteries, Eagle-Picher Model No. 3QK-11. The evaluation was also to include transistorized controllers: one manufactured by Electric Vehicle Components, Inc. operating at 400 Hz; and the other manufactured by PMC operating at 4000 Hz. On-board chargers specifically designed for tubular batteries were used. The test vehicles were Electra Van 600, one of which was already in use at SNLA and the other was to be provided by Aerospace. Data would be taken with on-board Curtis Integrators, and when they became available, the Versatile Data Acquisition System being build by MERADCOM. The first vehicle, identified as 314, was modified and became operational on April 5, 1982. Since that time, the vehicle has logged 3787 km. The second vehicle, identified as 312, required extensive repair to the drive train and did not become operational until June 2, 1982. Since that time, the vehicle has logged 1226 km. The evaluation was conducted in actual-use conditions. That is, the vehicles were assigned to specific organizations who could assure a significant daily distance (20 to 30 km) traveled. The vehicles are described as modified for the evaluation, data are presented on the charge and discharge characteristics of the batteries in the vehicles and the performance data with temperature effects acquired to date are presented.

3308 Alternative Fuels

REFER ALSO TO CITATION(S) 48596

49461 **(AD-A—127954/6) Decision models for conducting an economic analysis of alternative fuels for the ice engine. Master's thesis.** Garrison, C.F. Jr. (Naval Postgraduate School, Monterey, CA (USA)). Mar 1983. 97p. NTIS, PC A05/MF A01.

An economic analysis is made of vehicles powered by compressed natural gas (CNG), alcohol, and electric vehicles (EV's) as possible replacements for gasoline-powered vehicles. Advantages and disadvantages of vehicles powered by the various fuels are discussed and determinations of their suitability are made based on vehicle performance characteristics and fuel availability. CNG and EV's are determined to be viable alternatives based on current state-of-the-art technology. Alcohol is not retained as a viable alternative because of limited fuel availability. Models are presented for determining the total life cycle cost for gasoline, CNG, and EV's. A fleet of seventy-two vehicles at the Naval Postgraduate School is used as an example to compare the cost of each alternative. A linear program is used to determine the mix of gasoline, CNG, and electric vehicles that satisfy mission requirements for the least total fleet life cycle cost and to perform sensitivity analysis on the cost determinants. A generalized formulation is also presented to allow a vehicle fleet manager to use the methodology of this thesis as an aid to evaluating the potential of alternatively-fueled vehicles in different situations.

49462 **(DOE/BC/10343—1) Effect of low-proof fuel alcohol on crankcase oil dilution in an Otto-cycle engine. Final report.** Mingle, J.G.; Boubel, R.W. (Oregon State Univ., Corvallis (USA)). Jul 1983. Contract AS19-80BC10343. 39p. NTIS, PC A03/MF A01. Order Number DE83016425.

A laboratory experiment, using a 1974 model-year Ford, 2.3 liter, 4-cylinder overhead cam engine, was conducted to evaluate those parameters which might result in the dilution of crankcase oil with excessive amounts of alcohol or water. Ethanol of 130 to 180 proof was used in the engine for a test duration of six hours (unless the color of the oil changed indicating presence of water). Air-to-fuel mixture ratio was held at a value which gave constant yields of about 1 percent carbon monoxide in the exhaust gases, although two additional tests were conducted where the carbon monoxide in the exhaust was increased to about 6 percent to determine the gross effect of mixture ratio. Twenty-four engine tests were conducted, and the crankcase oil was sampled after each test was compelted. Tests were also conducted at reduced engine oil and water temperature. Five standard ASTM and two nonstandard analytical tests were employed to determine the quantitative amount of alcohol and/or water found in the crankcase oil. ASTM D-95, water by distillation, and ASTM D-96, water by centrifuge, appear to be the most reliable analytical tests to determine the amount of water. The viscosity by the Brookfield Viscosimeter is a very quick and easy test to perform and, properly calibrated, would be quantitatively acceptable. Results suggest that, with this engine, the use of ethanol at proof quality less than 130 may result in an accumulation of water in the crankcase which may lead to inadequate engine lubrication.

49463 **(DOE/BETC/RI—83/4) Vehicle-emission characteristics using mechanically emulsified alcohol/diesel fuels.** Allsup, J.R.; Seizinger, D.E.; Cox, F.W.; Brook, A.L.; McClellan, R.O. (USDOE Bartlesville Energy Technology Center, OK; Inhalation Toxicology Research Inst., Albuquerque, NM (USA)). Jul 1983. 12p. NTIS, PC A02/MF A01. Order Number DE83016012.

A light-duty diesel vehicle fueled with an emulsified alcohol/diesel fuel was operated under cyclic mode. Emission and fuel economy measurements were taken during vehicle operation. The test results showed the volumetric fuel economy decreased slightly. Carbon monoxide emissions increased slightly, and oxides of nitrogen showed no significant change. Particulate emissions were reduced slightly, and the particulate extractables increased slightly. The environmental effect of these data cancel each other resulting

in no significant changes in the total release of biological activity into the environment.

49464 (SIND-PM—1982-18) Market and the production cost of alternative fuels. Two consutative studies. (Statens Industriverk, Stockholm (Sweden)). 1982. 177p. (In Swedish). NTIS (US Sales Only), PC A09/MF A01. Order Number DE83750985.

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The report consists of two studies, titled Alternative fuels on the Swedish market and Updating of costs for production of methanol from natural gas and vacuum residue feedstock. The need of governmental steering to stimulating the transition to alternative fuels is discussed and the calculations of the costs fort the production of methanol out of natural gas and waste oils are presented.

36 MATERIALS

49465 (LA-UR—83-2081) Precise ultrahigh-pressure experiments. Ragan, C. E. III; Diven, B.C.; Rich, M.; Teasdale, W.A.; Robinson, E.E. (Los Alamos National Lab., NM (USA)). 1983. Contract W-7405-ENG-36. 5p. (CONF-830719—41). NTIS, PC A02/MF A01. Order Number DE83015247.

From American Physical Society meeting on shock waves in condensed media; Santa Fe, NM, USA (18 Jul 1983).

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A nuclear-explosive-generated shock has been used to obtain Hugoniot data at pressures corresponding to threefold compressions. The shock passed through a 12-mm-thick by 180-mm-dia molybdenum base plates and into 13 samples; 80 electrical-contact pins were used to determine shock velocities with uncertainties of 1.4 to 2.6%. The measured molybdenum shock velocity of 30.60 km/s corresponds to a pressure of 6.43 TPa, based on its SESAME equation of state. Impedance-matching analyses provided Hugoniot data in pressure (TPa)-particle velocity (km/s) coordinates (P, u) for the following materials; Al(2.93, 27.57), 19%-porosity Mo(4.65, 19.99), C(2.64, 28.38), LiH(1.225, 35.52), Cu(6.06, 21.15), Fe(5.71, 21.73), and crystalline quartz (2.75, 26.76). These results indicate the need for improved theoretical calculations for some materials.

3601 Metals And Alloys

REFER ALSO TO CITATION(S) 48600, 48666, 48674, 48674, 48727, 48757, 48757, 48984, 49022, 49076, 49195, 49573, 49815, 49997, 50151

49466 (ANL—82-43) Study of chromium-free and chromium-reduced steels. Wiencek, T.C.; Thresh, H.R. (Argonne National Lab., IL (USA)). May 1983. Contract W-31-109-ENG-38. 24p. NTIS, PC A02/MF A01. Order Number DE83016717.

Goal was to develop an iron-based alloy, similar to Type 316 stainless steel in mechanical and corrosion properties but with a reduced Cr content or, ideally, no Cr. A total of twenty-six 225-g ingots and ten 2.5 to 12 kg ingots of various compositions in the Fe-Si-Mn-Ni-C system were prepared. All ingots contained from 5 to 11 w/o silicon and drew their corrosion resistance primarily from this component. The composition ranges of the remaining major alloying elements were (in w/o) 0-24 Mn, 0-35 Ni, and 0.08 to 0.95 C. Most of the alloys were reduced to sheet, demonstrating the hot fabricability of these high-silicon alloys. The mechanical and corrosion properties of these alloys are attractive. Tensile tests showed yield strengths of 303 to 379 Mpa (44 to 55 ksi), ultimate tensile strengths of 731 to 882 MPa (106 to 128 ksi), and elongations of 34 to 77%. Air oxidation rates were lower than those of 300-series stainless steels at 1000°C. Salt water corrosion rates for these alloys fall between those of stainless steels and plain carbon steels and are 5 to 10 times lower than the rates for plain carbon steels.

49467 (CNEA-NT—3/82) Hydrogen damage in metals, particularly in steels. Funes, A.J. (Comision Nacional de Energia Atomica, Buenos Aires (Argentina)). Mar 1982. 64p. (In Spanish). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702403.

Hydrogen damage examples of practical interest for the engineer are presented, showing the scope of the problem and its importance in relation to technological development, particularly of CA236943DU reactor and of heavy water production plants. The fundamental triangle of the hydrogen embrittlement is established as follows: presence of hydrogen in the crystalline network, structure susceptible of damage, and effort. The initial collection of examples is classified in function of the observed effects. For the consideration of the causes of said effects three models of hydrogen interaction with the crystalline network are described, indicating their scopes and limitations. Then the use of the models is explained, both in order to obtain practical information (evaluation tests, acceptance and rejection criteria) and for the validation and improvement of the models themselves (study methods). Solutions for attenuating the hydrogen embrittlement and a programme of studies and tests are proposed to be carried out by the National Atomic Energy Commission. Among the latter, the local development of a microimpression method to detect the evaluation of absorbed hydrogen, comparable with the autoradiography of high resolution, and a mechanical test yielding results on fragility comparable with those obtained through the test of standard disks, are described.

49468 (CONF-830680—2) Electron-microscope observation of crack propagation and a dislocation model of fracture. Ohr, S.M. (Oak Ridge National Lab., TN (USA)). 1983. Contract W-7405-ENG-26. 10p. NTIS, PC A02/MF A01. Order Number DE83014623.

From International symposium on the structure and properties of crystal defects; Liblice, Czechoslovakia (13 Jun 1983).

This paper describes electron microscope observations of the emission and distribution of dislocations at the crack tip during in-situ tensile deformation. The most interesting result has been the direct observation of a dislocation-free zone (DFZ) between the crack tip and the plastic zone. In order to understand the origin of the DFZ, a dislocation theory of fracture has been developed and the critical stress intensity factor K/sub g/ for the dislocation generation at the crack tip is proposed as the definition for the condition for crack tip deformation.

49469 (DOE/ER/10963—1) Microstructural effects in abrasive wear. Second annual progress report, August 10, 1982-August 12, 1983. Kosel, T.H. (Notre Dame Univ., IN (USA). Dept. of Metallurgical Engineering and Materials Science). 12 Aug 1983. Contract AC02-81ER10963. 61p. NTIS, PC A04/MF A01. Order Number DE83016384.

Progress has been made in understanding the mechanisms of carbide removal during abrasion by quartz abrasive. In situ SEM scratch tests have demonstrated that carbide fracture is the controlling process in quartz abrasion of white cast irons, suggesting that carbide toughness is a critical parameter in controlling abrasion resistance. A study of surface recrystallization during abrasion has yielded definite evidence of the occurrence of recrystallization in pure Al. A program to investigate the effects of vanadium additions and heat treatments on the abrasion resistance of white cast iron indicate that optimum abrasion resistance as well as optimum spalling resistance may be obtained using a subcritical annealing heat treatment. A new study of the effect of abrasive particle size on abrasion in dual-phase alloys has demonstrated the opposite effect from that observed in single-phase alloys for quartz abrasive, whereas with Al_2O_3 particles, dual-phase and single-phase alloys behave more similarly.

49470 (DOE/ER/13000—T1) Structural studies of amorphous Mo-Ge alloys through the semiconductor-metal transition. Kortright, J.; Bienenstock, A. (Stanford Univ., CA (USA). Dept. of Materials Science and Engineering). 1983. Contract AC03-82ER13000. 5p. NTIS, PC A02/MF A01. Order Number DE83016525.

Changing atomic scale structure through the semiconductor-metal transition in amorphous Mo-Ge films has been studied with RDF, differential anomalous scattering, EXAFS and small-angle scattering techniques. Mo remains most closely coordinated by Ge through this structural transition, with no evidence for separation into well-defined amorphous phases on a size scale of 20 A and up. All evidence of the a-Ge network has disappeared by about 23% Mo.

49471 (IA—1367) **Measuring irradiation creep. Simulation of fusion-neutron induced damage by beams of light ions from an accelerator. Technical note.** Pelah, I. (Israel Atomic Energy Commission, Yavne. Soreq Nuclear Research Center). Mar 1981. 7p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702309.

Simulation of fusion-neutron induced damage by beams of light ions is discussed. It is suggested that accelerated creep measurements to determine "end of life" of materials may be done by the application of thermal treatment and thermal creep measurements.

49472 (IA—1375, pp 74-75) **Spin reorientation in $Pr_2(Cosub(1-x)Fesub(x))_{17}$.** Melamud, M. (Israel Atomic Energy Commission, Tel Aviv); Hathaway, K.; Callen, E. (Naval Surface Weapons Center, Silver Spring, MD (USA)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49473 (IA—1375, pp 104-105) **Hydrogen occupancy in ZrNi.** Gurewitz, E. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49474 (IA—1375, pp 106-107) **Initial stages of the U-H reaction. A kinetic study with a hot-stage microscope.** Bloch, J.; Simca, F.; Kroup, M.; Stern, A.; Shmariahu, D.; Mintz, M.H. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49475 (IA—1375, pp 107-109) **Flow and strain-hardening of austenitic stainless steels after thermal precharging with hydrogen gas at moderate pressure.** Rosenthal, Y.; Mark-Markowitch, M.; Magen, A.; Stern, A. (Israel Atomic Energy Commission, Tel Aviv); Eliezer, D. (Ben-Gurion Univ. of the Negev, Beersheba (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49476 (IA—1375, pp 109-110) **Effects of high temperature aging in hydrogen gas on plastic flow and fracture of Ti-modified 316 austenitic stainless steel.** Mark-Markowitch, M.; Cohen, P.; Magen, A.; Rosenthal, Y.; Stern, A. (Israel Atomic Energy Commission, Tel Aviv); Eliezer, D. (Ben-Gurion Univ. of the Negev, Beersheba (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49477 (IA—1375, pp 111-112) **Hydrogen embrittlement of austenitic stainless steel welds.** Simca, F.; Stern, A. (Israel Atomic Energy Commission, Tel Aviv); Eliezer, D. (Ben-Gurion Univ. of the Negev, Beersheba (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49478 (IA—1375, pp 119) **Corrosion effect of solutions of lasing dyes on metals.** Rabinovitz, E.; Hermann, B.; Levin, R. (Israel Atomic Energy Commission, Tel Aviv); Rosenthal, I. (Ministry of Agriculture, Bet Dagan (Israel). Agricultural Research Organization). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49479 (IA—1375, pp 115-117) **Liquid phase sintering of an iron-copper powder mixture.** Stern, A.; Simca, F.; Shmariahu, D. (Israel Atomic Energy Commission, Tel Aviv); Levin, L. (Technion-Israel Inst. of Tech., Haifa). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49480 (IA—1375, pp 97) **Role of indium in the catalysis of the magnesium-hydrogen reaction. An electron spectroscopy surface study.** Mintz, M.H.; Bloch, J.; Shamir, N.; Atzmony, U. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49481 (IAEA-TECDOC—263, pp 241-258) **Correlation of macroscopic material properties with microscopic nuclear data.** Simons, R.L. (Hanford Engineering Development Lab., Richland, WA (USA)). Apr 1982. NTIS (US Sales Only), PC A15/MF A01. (CONF-811070—).

From IAEA advisory group meeting on nuclear data for radiation damage and safety; Vienna, Austria (12 Oct 1981).

This paper reviews the application of nuclear data to the correlation of neutron irradiation induced damage to materials. Two primary irradiation induced changes in the material occur during neutron irradiation (displacement of atoms forming crystal defects and the transmutation of atoms into gaseous or solid products). The largest uncertainty in the calculation of crystal defects is due to the atomic model. Several alternate computer simulation or experimental based models are discussed. A review of recent experiments to validate the displacement cross section based on the modified Kinchen and Pease model is presented. The most notable problem in such experiments is the competing effects of damage rate or flux level. Recent experiments and calculations on the effect of transmutations on swelling and yield strength show that the buildup of selected transmutation products cannot be neglected. It is concluded that goal accuracies for nuclear data should be based on a need to determine integral damage parameters to within 10-20 percent (1 σ).

49482 (IC—81/164) **Energy band theory of heterometal superposed film and relevant comments on superconductivity in heterometal systems.** Zhang, L.; Yin, D. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1981. 17p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702269.

A method for calculating the electronic structure of a heterogeneous metal-metal interface is discussed. It combines a series of well-defined interface plane-wave orbitals and the muffin-tin orbitals. The problem of high-Tsub(c) superconductivity in systems containing metal-metal interfaces and the related problem in compounds is addressed.

49483 (IC—82/126) **Superfluid spin phase in ferromagnetic chains.** Baskaran, G. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1982. 13p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702515.

I show that for a spin-1/2 ferromagnetic Heisenberg chain, a new spontaneously broken symmetry state with no spontaneous magnetization, degenerate to the ferromagnetically ordered ground state exists in a generalized mean field theory. It has off-diagonal long-range order. Consequently a 3-dimensional system of weakly coupled ferromagnetic chains can have this new order at low temperatures. Some interesting experimentally observable predictions are made.

49484 (INIS-SU—147, pp 69-76) **Void formation in nickel under 50 keV nickel ion irradiation.** Rudnev, S.I.; Konobeev, Yu.V.; Panin, S.D. (Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Obninsk. Fiziko-Ehnergeticheskij Inst.). 1981. (In Russian). NTIS (US Sales Only), PC A06/MF A01. (CONF-810293—No.5).

From 2. all-union conference on radiation physics of solids; Zvenigorod, USSR (24 Feb 1981).

Nickel samples were irradiated by 50 keV nickel ions at temperatures 450, 550, 600 and 650 deg C to doses of 1.2, 2.5, 5, 10, 20, 30, and 40 dpa. Analysis of experimental results permitted temperature- and dose dependence of sizes of voids and dislocation loops as well as that of swelling to be satisfactorily described by theory on the assumption on diffusion-controlled growth kinetics of point defect clusters. Swelling increased with the increasing dose according to the power law; with the exponent being a function of temperature. The temperature dependence of the preference parameter was found to be similar to that for swelling, having a single peak at 600 deg C.

49485 (IS-RIC-PR—5) Critical evaluation of binary-rare-earth phase diagrams. Progress report, September 1, 1982-February 28, 1983. Gschneidner, K.A. Jr.; Calderwood, F.W. (Iowa State Univ. of Science and Technology, Ames (USA). Energy and Mineral Resources Research Inst.). Mar 1983. Contract W-7405-ENG-82. 129p. NTIS, PC A07/MF A01. Order Number DE83016407.

This is the fifth in this series of quarterly reports. It reports on the crystal structures, phase diagrams, and thermodynamic properties of binary mixtures of aluminium with rare earths. 82 references, 201 figures, 50 tables. (DLC)

49486 (IS-T—1058) Solubility and diffusion of hydrogen in vanadium-oxygen alloys. Schlader, B.J. (Ames Lab., IA (USA)). Jun 1983. Contract W-7405-ENG-82. 33p. NTIS, PC A03/MF A01. Order Number DE83016142.

Thesis.

Pressure-composition isotherms at 297 and 373 K were obtained by an isopiestic solubility technique. A small increase in the isopiestic solubility of hydrogen was caused by the addition of oxygen to vanadium, but Sieverts' law was obeyed in each alloy in the hydrogen concentration ranges studied. The macroscopic hydrogen diffusion coefficient as a function of hydrogen concentration was measured at 227, 297 and 373 K by a Boltzmann-Matano method. This method also allowed a determination of the terminal hydrogen solid solubility. A decrease in the hydrogen diffusion coefficient was observed with increasing oxygn concentrations. The observed solubility and diffusion results do not change with hydrogen concentration to show a trap saturation effect as predicted in local deep trap models. The terminal hydrogen solid solubility increased slightly with oxygen concentration.

49487 (IS-T—1071) Transformation strain dependence on applied stress in equiatomic nickel-titanium alloys of powder-metallurgical origin. Ramon, P. (Ames Lab., IA (USA)). Jun 1983. Contract W-7405-ENG-82. 236p. NTIS, PC A11/MF A01. Order Number DE83016144.

Thesis.

The strain-temperature behavior of Ni-Ti samples upon martensitic phase transformation was investigated as a function of applied uniaxial tensile and compressive stresses. The samples were cycled in temperature when they were held in grips, which permitted a deadweight axial stress to be applied. It was found in the absence of an applied stress that the strains upon transformation were nearly isotropic. By contrast, as the uniaxial tensile stress was increased, the axial and circumferential strains became increasingly different, i.e., the axial strain corresponded to an expansion upon transformation on cooling and the circumferential strain to a contraction. The magnitudes of these strains increased progressively with increasing stress. Similar results were obtained for uniaxial compressive stresses, except that the axial strain corresponded to a contraction and the circumferential strain to an expansion upon transformation on cooling. The observation that the transformation strain increases with increasing applied stress is explained on the basis of a preferred activation model (PAM). The phenomenological theory of Wechsler-Lieberman and Read (WLR) is applied, and the semiaxes of the total distortion ellipsoid calculated. The calculated total distortions predict the saturation limit of phase transformation strains with increasing applied uniaxial tensile stress.

49488 (JAERI-M—82-049) Studies on fatigue crack growth around weldment in SUS304 stainless steel. Prediction of crack growth behavior in residual stress field. Shibata, K.; Kawamura, R. (Japan Atomic Energy Research Inst., Tokyo). May 1982. 30p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702402.

Many failures in welded structures are caused due to the initiation and propagation of cracks which are induced by the high welding residual stress. Up to now, it has been known that the welding residual stress has many influences on the crack initiation and propagation, but the problems of the influence of welding residual stress on the structural integrity are not so clear to date because of the difficulty of its quantitative evaluation and of the analysis on the interaction between the residual stress and crack growth. Recently, an analytical procedure to predict the fatigue crack growth based on fracture mechanics has been introduced in some inspection standards and criteria for the purpose of preventing the brittle fracture. It seems important to perform the accurate crack growth predictions as regards the valid application of the above standards, as well as the practice of reliable defect sizing. Therefore it is one of the important subjects to evaluate the influence of welding residual stress on the fatigue crack growth. Relaxation and redistribution of the residual stress will be caused when crack extends in the residual stress field. Besides, an interaction effect between the fatigue stress and residual stress will be caused at the same time. In this report is described a simple prediction on the fatigue crack growth behavior in the residual stress field firstly, and then the predictions are compared with the results of fatigue tests on center cracked pannel specimen of SUS304 stainless steel.

49489 (JAERI-M—82-061) Study of γ-ray irradiation effects on corrosion resistance of alloys for storage of high-level waste packages, (1). Furuya, T.; Muraoka, S.; Tashiro, S.; Araki, K.; Tomari, H.; Fujiwara, K.; Fukuzuka, T. (Japan Atomic Energy Research Inst., Tokyo). Jun 1982. 32p. (In Japanese). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702400.

The effects of γ-ray irradiation on corrosion resistance have been studied about candidate alloys as high-level waste canisters, overpacks and storage fasility materials. The purpose of this study is to evaluate integrity of alloys in the view of safety evaluation for interim storage systems such as water and air cooling system. Stress corrosion cracking (SCC) test has been carried out and the double U-bend type specimens were used. The alloys tested were Type 304 ss, Type 304L ss, Type 304EL ss, Type 309s ss, Incoloy 825, Inconel 600, Inconel 625 and SMA 50. Sensitized Type 304 ss, Type 304L ss and Type 309s ss have been found to be susceptible to SCC because of radiolysis in boiling deionized water with γ-ray irradiation but not without irradiation. It was also confirmed that they were susceptible to SCC under the existence of a little chloride ion and dissolved oxygen even without γ-ray irradiation. Fractographic observation revealed that the cracking mode was completely intergranular. The other alloys were not susceptible to SCC, but SMA 50 rusted over its surface. On the other hand, no alloy was susceptible to SCC in atmosphere at room temperature even with γ-ray irradiation. This study was carried out in corporation at JAERI and Kobe Steel Ltd.

49490 (JAERI-M—9949) Oxidation and creep tests of hastelloy-S in VHTR helium environment. Ogawa, Y.; Shindo, M.; Kondo, T. (Japan Atomic Energy Research Inst., Tokyo). Feb 1982. 31p. (In Japanese). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702401.

Hastelloy-S, developed by Cabot Corp. for the applications involving severe cyclic heating condition, was tested for its potential applicability to VHTRs as one of the structural alloys. It is said that the alloy has excellent microstructural stability, low thermal expansion and outstanding oxidation resistance. The corrosion test and creep test of the alloy-S were carried out in simulated VHTR helium environment, and the results were compared with those of Hastelloy-XR ehich is one of the candidate materials for VHTR structural components. The results obtained were as follows. The oxidation resistance of the alloy-S was better than that of the alloy-XR. The oxidation resistance was increased by lowering the Cr content and increasing the relative ratio of Mn to Cr in Ni-base alloys. Localized oxidation was observed in the alloy-S at grain boundaries due to the internal oxidation of Al contained in the alloy. The creep strength of the alloy-S was lower than that of the alloy-XR. The comparison of creep property was made between the as-received material and the material with coarse grains formed by heat treatment. From the results obtained so far, it was judged that the alloy-S has not sufficient capability to be substituted for the alloy-XR.

49491 (KU-HCOE-FL2-R—82-06) Extended solubility and martensitic hcp nickel formation in antimony implanted nickel. Johnson, E.; Sarholt-Kristensen, L.; Johansen, A. (Copenhagen Univ. (Denmark). H.C. Oersted Inst.). 1982. 19p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702259.

Radiation damage microstructure and associated disorder have been investigated in antimony implanted nickel crystals using combined RBS and TEM analyses. In crystals implanted at and below room temperature with 80 keV Sb^+ ions to a fluence of $5x10^{20}$ m^{-2}, the retained antimony concentration in the implantation zone is approaching 15 at.%, with nearly all the antimony located substitutionally. The associated disorder as seen in the RBS analysis is insignificant. Annealing up to 600°C has little influence on the antimony distribution, whilst the dechanneling level is reduced. TEM and diffraction analysis of room temperature implanted samples show that the radiation damage consists of dense distributions of dislocation clusters and tangles, superimposed on a rather homogeneous background of new phase particles, identified as hcp nickel. The particles have a size 0.1-0.2 μm. The high substitutional antimony concentration at and below room temperature, which exceeds the solubility limit, indicates that its formation is thermally diffusionless and rather an effect of radiation enhanced solubility. The diffusionless nature of the microstructure is also indicated from the presence of martensitic hcp nickel, believed to form due to relief of radiation induced internal stress.

49492 **(LA-UR—83-2138) Three-dimensional computer modeling of a shock-recovery experiment.** Rabie, R.L.; Vorthman, J.E.; Dienes, J.K. (Los Alamos National Lab., NM (USA)). 1983. Contract W-7405-ENG-36. 5p. (CONF-830719—21). NTIS, PC A02/MF A01. Order Number DE83015915.

From American Physical Society meeting on shock waves in condensed media; Santa Fe, NM, USA (18 Jul 1983).

An ideal shock recovery experiment would be to subject a sample material to a single, well-defined shock followed by a controlled, benign release of the stresses and velocities generated. The process should be such that any change found in the sample after recovery could be attributed to the shock process alone. In any real experiment with finite-sized samples, rarefaction waves are generated at the edges of the sample. In general these rarefaction waves can have a large effect on the sample, which is impossible to separate from the effects of the shock alone. It has been suggested that samples of certain shapes will have a small region in their interiors, which is substantially free from the effects of edge rarefactions. We will present the results of three-dimensional computer calculations done to test this hypothesis.

49493 **(LBL—14175) Influence of rapid thermal cycles in multipass welding on heat-affected-zone properties in ferritic cryogenic steels.** Kim, H.J.; Shin, H.K.; Morris, J.W. Jr. (Lawrence Berkeley Lab., CA (USA)). May 1982. Contract AC03-76SF00098. 11p. (CONF-820546—16). NTIS, PC A02/MF A01. Order Number DE83015715.

From 9. international cryogenic engineering conference; Kobe, Japan (10 May 1982).

The results of both welding and weld simulation studies on 2BT-treated 9Ni steel show that multiple rapid thermal cycles have a very beneficial effect on heat-affected zone toughness at cryogenic temperatures. The metallurgical sources of toughness are, however, different from those in the furnace-treated base plate. The rapidly cycled material contains no detectable austenite phase. The alloy is grain-refined by the rapid thermal cycle, and the matrix carbon content is relieved by the formation of interlathcementite precipitates which do not destroy toughness.

49494 **(LBL—14704) Dimensionality and its effects upon the valence electronic structure of ordered metallic systems.** Tobin, J.G. (Lawrence Berkeley Lab., CA (USA)). Jul 1983. Contract AC03-76SF00098. 193p. NTIS, PC A09/MF A01. Order Number DE83016320.

Thesis.

The system c(10x2)Ag/Cu(001) was investigated with Angle-Resolved Photoemission (ARP), Low Energy Electron Diffraction (LEED) and Auger Electron Spectroscopy (AES). LEED and AES provided the calibration of a quartz microbalance used to measure the amount of silver evaporated onto the copper single crystal and also established the monolayer geometrical structure at one monolayer exposure. An off-normal ARP bandmapping study performed with polarized HeI and NeI radiation demonstrated the electronically two-dimensional nature of the silver d-bands at coverages of near one monolayer. The states at the surface Brillouin Zone center were assigned upon the basis of their polarization dependences and a structural model of hexagonal symmetry. A normal emission ARP experiment was performed at the Stanford Synchrotron Radiation Laboratory (SSRL) over the photon energy range of 6 to 32 eV. Data from it documented the evolution of the valence electronic structure of the silver overlayer from a two-dimensional hexagonal valence to a three-dimensional behavior converging towards that of bulk Ag(111). A structural study was attempted using the ARP technique of Normal Emission Photoelectron Diffraction over the photon energy range of 3.4 to 3.7 keV at SSRL, the results of which are inconclusive.

49495 **(LBL—15864) Austenite stability and its influence on mechanical properties of 18-8 stainless steel at cryogenic temperatures.** Chang, G.M. (Lawrence Berkeley Lab., CA (USA)). Jun 1983. Contract AC03-76SF00098. 54p. NTIS, PC A04/MF A01. Order Number DE83016682.

Thesis.

Stress/strain induced martensitic transformation has been found to play an important role on the mechanical properties of metastable austenitic stainless steels. Typical two-stage stress-strain curves were observed for AISI 304L and 304LN stainless steels containing 18% Cr and 8%Ni. The martensite phase induced in the high-work-hardening stage was found, by transmission electron microscopy, to be accommodated by mechanical twinning. The drop of 0.2% offset yield strength caused by the dilation and induced slip associated with the martensitic transformation of the low-carbon-content 304L was observed at liquid nitrogen temperature. Low temperature favorable fatigue properties were observed for 304L but not for 304LN. Below the M/sub d/ temperature, the fatigue crack propagation in metastable austenitic steels can be assumed to be the same as crack growth in an austenite and martensite composite. Although fatigue cracks grew faster in the martensite phase than in the austenite phase, the compressive stress near the crack tip due to the martensitic transformation appeared to reduce the effective stress intensity range which resulted in a decreased crack growth rate. The controlling factor became K/sub max/ instead of Δ K if the load ratio R was not large. The addition of interstitial nitrogen, which stabilizes the austenite phase, reduced the compressive stress at crack tips and resulted in the temperature-insensitive fatigue properties. Both the austenite phase and the martensite phase were found to be ductile at liquid nitrogen temperature.

49496 **(LBL—16024) Fatigue-crack growth behavior in a nitrogen-strengthened high-manganese steel at cryogenic temperatures.** Ogawa, R.; Morris, J.W. Jr. (Lawrence Berkeley Lab., CA (USA)). May 1983. Contract AC03-76SF00098. 19p. (CONF-8305120—1). NTIS, PC A02/MF A01. Order Number DE83016619.

From Metallurgical Society symposium on fatigue at low temperatures; Louisville, KY, USA (10 May 1983).

The fatigue crack growth rate (FCGR) of a nitrogen-strengthened high manganese stainless steel of nominal composition 18Mn-5Ni-16Cr-0.02C-0.22N was determined in the intermediate stress-intensity factor range (20 to 70 MPa m) at 77K and 4K. Fractographic investigations were performed on the fracture surfaces. The FCGR at 4K is very nearly the same as that at 77K and substantially below the crack growth rate for AISI 304LN steel. The fracture surfaces of both the high-manganese alloy and the 304LN showed a transgranular failure mode, but the detailed fractographic features varied with temperature and alloy type. The fractography was closely related to changes in the FCGR.

49497 **(LBL—16233) Thermochemistry of acid-base stabilized transition-metal alloys by carbide and nitride equilibria and Knudsen effusion-vapor pressures.** Gibson, J.K.M. (Lawrence Berkeley Lab., CA (USA)). Jul 1983. Contract AC03-76SF00098. 156p. NTIS, PC A08/MF A01. Order Number DE83016319.

Thesis.

The thermochemistry of several Lewis acid-base stabilized transition metal alloys has been investigated and the results interpreted within the context of the Engel-Brewer theory to further clarify and quantify the factors which determine the extent of this type of interaction. Binary alloys of a platinum group metal (Ru,

Os, Ir, Pd, Pt, or Au) with a group IVB-VIB transition element (Ti, Zr, Hf, Nb, Ta, or W) were studied by equilibration of the alloy with the appropriate IVB-VIB carbide or nitride or by measuring the vapor pressure of one of the two components by thermogravimetric or mass spectrometric Knudsen effusion experiments. Twenty-seven binary alloys were studied at temperatures ranging from 1425 K to 2750 K and the activities established ranged from a/sub Zr(ZrPt/sub 3/) = 6 x 10^{-6} to a/sub Pd(82 at. % Pd-Nb/) approx. = 1, both at 1900 K. Among the implications of the results obtained are that reduced bonding ability due to crystal field effects can severely limit the extent of acid-base interaction and the effect of valence d orbital contraction is relatively minor for the 4d (e.g., Zr) compared with the 5d (e.g., Hf) elements but is significant for the 3d (e.g., Ti) elements. 98 references, 14 figures, 10 tables.

49498 **(LBL—16290) Phonon-induced enhancements of the energy gap and critical current in superconducting aluminum.** Seligson, D. (Lawrence Berkeley Lab., CA (USA)). May 1983. Contract AC03-76SF00098. 166p. NTIS, PC A08/MF A01. Order Number DE83015210.

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8 to 10 GHz phonons were generated by piezoelectric transduction of a microwave and by means of a quartz delay line, were allowed to enter the aluminum only after the microwaves had long since disappeared. The maximum enhancements detected were [δT/T/sub c/] = -0.07, for i/sub c/ and [δT/T/sub c/] = -0.03 for Δ. The power- and temperature-dependence (0.82 ≦ T/T/sub c/ ≦ 0.994) of the enhancements were compared with the prediction of a theory given by Eliashberg. The gap-enhancement was in good agreement with the theory only for low input lower. The critical current measurements are predicted to be in rough agreement with the Δ measurements but this was not observed. The magnitude of the critical current enhancements was typically more than twice the observed gap enhancements. The measured critical current enhancement was relatively independent of temperature whereas the gap enhancement decreased rapidly as the temperature was lowered.

49499 **(NP—3770325) Investigation of the hydrogen-induced susceptibility to cold cracking of high-strength low-alloy fine-grained structural steels by means of the implant test.** Neumann, V. (Bundesanstalt fuer Materialpruefung, Berlin (Germany, F.R.)). Dec 1981. 53p. (In German). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83770325.

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The problem of hydrogen-induced cold cracking tendency of high stength low alloyed (HSLA) steels, their factors of influence and methods of evaluation are presented. The implant test has been chosen out of the range of the possible test procedures. This test procedure, a sort of creep rupture tension test of a small welded specimen, is seen as a system. The single areas of this system are investigated in view of their influence on the test results. These areas are: the loading apparatus, the measuring equipment, the filler materials and auxiliary materials and the implant specimen. Referring to that the effect of the tree parameters of cold cracks - hydrogen, transformation behaviour of base metal and stresses - is evaluated by the results of implant tests. Six different HSLA steels were under investigation. For one part of the experiments the submerged-arc process with basic powders was used. The other part was welded with coated basic electrodes.

49500 **(ORNL/CSD—117) Modeling binary-alloy solidification processes.** Alexiades, V.; Wilson, D.G.; Solomon, A.D. (Oak Ridge National Lab., TN (USA)). Aug 1983. Contract W-7405-ENG-26. 33p. NTIS, PC A03/MF A01. Order Number DE83016343.

A macroscopic mathematical model is constructed describing the evolution of the phases of binary alloy or mixture undergoing solidification under the action of simultaneous conduction of heat and diffusion of solute. The formulation is global, in the form of a pair of conservation laws valid over the whole region occupied by the alloy in a weak (distributional) sense. Thus it is especially convenient for numerical solution since it does not require tracking of the interface, which, in fact, may develop into a mushy zone. 25 references.

49501 **(PNL-SA—11292) Corrosion resistance of amorphous and crystallized Fe-Ni-Cr-W alloys.** Wang, R. (Pacific Northwest Lab., Richland, WA (USA)). Aug 1983. Contract AC06-76RL01830. 7p. (CONF-830888—5). NTIS, PC A02/MF A01. Order Number DE83016815.

From 5. international conference on liquid and amorphous metals; Los Angeles, CA, USA (15 Aug 1983).

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The corrosion-resistant behavior of sputter-deposited amorphous and thermally crystallized Fe-Ni-Cr-W alloys was studied in chloride solutions using polarization methods. The amorphous alloys had excellent resistance to pitting in both neutral and acidic solutions. More significantly, the corrosion resistance of the alloys was preserved after heat treatment at the crystallization temperature. This was attributed to a two-stage crystallization process; thus, the amorphous matrix protects the alloy from corrosion of the crystallized phase.

49502 **(SAND—82-1479) Control of precious-metal plating baths using electrogravimetric analysis.** Yelton, W.G. (Sandia National Labs., Albuquerque, NM (USA)). Jul 1983. Contract AC04-76DP00789. 15p. NTIS, PC A02/MF A01. Order Number DE83016772.

This paper is an outline of an electrogravimetric method for inventory control of precious metal plating baths. The procedure is meant to be applicable to a plating shop environment to provide in-process control. A short review of procedural techniques for sample preparation and analysis is included. The paper deals with the basic how to approach for developing a practical system of analytical control of precious metal electroplating baths permitting accountability of 99% or greater.

49503 **(SKI-B—27-78) Residual stress measurements in welded specimens of pressure vessel type A533B. Final report SKI project no B27/28.** Gott, K. (Studsvik Energiteknik AB, Nykoeping (Sweden)). 3 May 1982. 28p. (STUDSVIK-EI—82-84). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702307.

Following a previous study in which high residual stresses were measured in a control weld from one of the Swedish nuclear power stations, Oskarshamn II, a second study was initiated to investigate the effect of post-weld heat treatment on the residual stresses in similar welded specimens of A 533B. One specimen was in the as-welded condition and one had been heat-treated for 20 h at 620 degrees C. The residual stresses were measured at six levels through the specimens using a combined X-ray diffraction camera and layering technique. The results were then corrected by using a mathematical model. From the results of the study the following conclusions have been drawn. The X-ray camera method used can be applied if sufficient care is taken in detailed execution, to determine the local residual stresses in thick weldments. The X-ray measurements must be corrected mathematically to take into account specimen relaxation on the removal of material. The heat-treatment at 620 deg C for 20 hours resulted in a considerable redistribution of the residual stresses. The absolute level was greatly reduced as were the local variations. The weldments contain local stress gradients which may not be significant for structural integrity after heat treatment. The direct applicability of such localized measurements in integrity calculations has yet to be demonstrated, as has the use of an average value.

49504 **(UCID—19819) Yield stress and strain-rate sensitivity of nickel over a wide temperature range.** Kassner, M.E.; Mahin, K.W. (Lawrence Livermore National Lab., CA (USA)). Jul 1983. Contract W-7405-ENG-48. 8p. NTIS, PC A02/MF A01. Order Number DE83016913.

The yield strength of annealed 205 nickel was determined over the temperature range 4 K to 1473 K. also determined was the constant-structure strain-rate sensitivity exponent, m. Values of m were determined over the same temperature range as the yield stress. The strain-rate sensitivity data are compared against the m values reported for other fcc metals.

49505 (UCRL—88754) **Prediction of microstructural modification in dynamically consolidated metal powders.** Gourdin, W.H. (Lawrence Livermore National Lab., CA (USA)). Jul 1983. Contract W-7405-ENG-48. 6p. (CONF-830719—38). NTIS, PC A02/MF A01. Order Number DE83015690.

From American Physical Society meeting on shock waves in condensed media; Santa Fe, NM, USA (18 Jul 1983).

A model is presented which describes the deposition of energy at the surface of powder particles during shock-wave consolidation. Solution of the thermal transport equation subject to boundary conditions of constant surface flux yields thermal histories which can be used to predict the type and extent of microstructural modifications following compaction. The application of the model to compacts of several different metal powders is discussed.

49506 (UCRL—88755) **Hugoniot measurements on unsintered metal powders.** Gourdin, W.H.; Weinland, S.L. (Lawrence Livermore National Lab., CA (USA)). Jul 1983. Contract W-7405-ENG-48. 5p. (CONF-830719—42). NTIS, PC A02/MF A01. Order Number DE83016364.

From American Physical Society meeting on shock waves in condensed media; Santa Fe, NM, USA (18 Jul 1983).

We have determined the Hugoniots of unsintered copper, aluminum alloy, and steel powders using carbon gauges. We find no evidence for an elastic precursor in our specimens. The copper and aluminum Hugoniots are well described by models which assume full densification. Complete densification of the steel powder, however, does not occur for stresses less than 3.0 GPa. Although carbon gauges perform well, systematic errors in gauge calibration are observed.

49507 **Trapping and surface recombination of deuterium in fusion reactor metals.** Myers, S.M. (Sandia Natl. Lab., Albuquerque NM 87185). *IEEE (Institute of Electrical and Electronics Engineers) Transactions on Nuclear Science;* **30**: No. 2, 1175-1178(Apr 1983). Contract AC04-76DP00789.

Ion implantation and ion beam analysis were used to examine bulk trapping and surface recombination for deuterium in Fe, Ni, and austenitic stainless steel. Irradiation-defect traps were characterized in the three metals, and substantially stronger traps were shown to be associated with small He bubbles. The rate of deuterium release at stainless steel and Fe surfaces was measured as a function of temperature and solution concentration. Trapping and surface recombination parameters were extracted by applying established theory for solute diffusion within a field of traps.

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49508 (IA—1375, pp 77) **Neutron diffraction study of the magnetic structures in RD_2(R = Tb, Dy, Ho and Er).** Shaked, H. (Argonne National Lab., IL (USA)); Westlake, D.G.; Faber, J.; Mueller, M.H. (Argonne National Lab., IL (USA)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49509 (IA—1375, pp 79-81) **X-ray photoelectron spectroscopy (XPS) studies of oxygen-stabilized $Tb_2MOsub(x)$ (M = Fe, Co, Ni; $0<x<0.5$) compounds.** Polak, M.; Mintz, M.H.; Dariel, M.P. (Israel Atomic Energy Commission, Tel Aviv); Hefetz, M. (Ben-Gurion Univ. of the Negev, Beersheba (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49510 (IA—1375, pp 83) **Moessbauer effect studies of Fe_2TiO_5. An anisotropic uniaxial spin glass.** Gurewitz, E.; Atzmony, U. (Israel Atomic Energy Commission, Tel Aviv); Gorodetzky, G. (Ben-Gurion Univ. of the Negev, Beersheba (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49511 (IA—1375, pp 104) **Interstitial site occupation in ZrNiH.** Shaked, H. (Israel Atomic Energy Commission, Tel Aviv); Westlake, D.G.; Mason, P.R.; McCart, B.R.; Mueller, M.H. (Argonne National Lab., IL (USA)); Matsumoto, T.; Amono, M. (National Research Inst. for Metals, Tokyo (Japan)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49512 (KFKI—1982-80) **Influence of production process on imperfection structure of metallic glasses studied by positron annihilation.** Marczis, L.; Kajcsos, Zs.; Granasy, L.; Kemeny, T.; Kiss, D.; Lovas, A.; Szeles, Cs.; Brauer, G. (Hungarian Academy of Sciences, Budapest. Central Research Inst. for Physics). Nov 1982. 15p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702256.

From 6th international conference on positron annihilation; Fort Worth, TX (USA) (1982).

$Fe_{40}Ni_{40}Si_{14}B_6$, $Co_{77}B_{23}$ and Fesub(100-x)Bsub(x) (x=14.8; 20; 23.3) metallic glasses produced under different technological conditions were investigated by positron annihilation lifetime and Doppler broadening measurements. It was found that the increased quenching rate led to an increased positron trapping. The dependence of the concentration of the quenched-in 'vacancy-like' defects on the quenching rate is also given. The effect of heat-treatment, electron irradiation and deformation was also investigated.

49513 (KFKI—1982-87) **Short range order in $(Ni_{65}Fe_{35})_{77}B_{23}$ metallic glass by neutron diffraction.** Svab, E.; Kroo, N.; Ishmaev, S.N.; Sadikov, I.P.; Chernyshov, A.A. (Hungarian Academy of Sciences, Budapest. Central Research Inst. for Physics). Nov 1982. 8p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702257.

The S(Q) structure factor of $(Ni_{65}Fe_{35})_{77}B_{23}$ metallic glass was measured by time-of-flight neutron diffraction up to 24 A^{-1} momentum transfer. The distribution of transition metal-boron and transition metal-transition metal first neighbour atom pairs is resolved in the distribution function obtained from S(Q) by Fourier transformation. The distances of these first neighbour pairs, the width of their distribution, the partial coordination numbers and the short range order parameter are given. The results on $(Ni_{65}Fe_{35})_{77}B_{23}$ and on the previously studied $Fe_{81}B_{19}$ amorphous alloys are compared.

49514 (LA-UR—83-2242) **Reflected shocks in SiO_2.** Fritz, J.N.; McQueen, R.G. (Los Alamos National Lab., NM (USA)). 1983. Contract W-7405-ENG-36. 5p. (CONF-830719—37). NTIS, PC A02/MF A01. Order Number DE83016274.

From American Physical Society meeting on shock waves in condensed media; Santa Fe, NM, USA (18 Jul 1983).

Pavlovskii et al, by compression by a magnetic field, find a transition on the quartz isentrope at 125 GPa. The transition, having a 2-fold inrease in density over and above the density increase from quartz to stishovite, is ascribed to the metalization of quartz. The geophysical implications of such a transition would be profound. One would not see such a transition in singly-shocked quartz because all the shock energy would be increasing the thermal energy. Accordingly, we have performed second-shock experiments on a fine-grained quartz. These data will be presented. No evidence for a catastrophic volume collapse was found for second shocks up to 145 GPa.

49515 (SAND—83-0773C) **Specific surface measurements of shock-modified powders.** Lee, Y.K.; Williams, F.L.; Graham, R.A.; Morosin, B. (Sandia National Labs., Albuquerque, NM (USA); New Mexico Univ., Albuquerque (USA). Dept. of Chemical and Nuclear Engineering). 1983. Contract AC04-76DP00789. 12p. (CONF-830719—37). NTIS, PC A02/MF A01. Order Number DE83016230.

From American Physical Society meeting on shock waves in condensed media; Santa Fe, NM, USA (18 Jul 1983).

Inorganic powder samples which have been subjected to controlled shock loading and preserved for post-shock investigation have been studied to determine the influence of shock compression

on specific surface areas. The BET technique provides a sensitive measure of complex surface areas and when shocked samples are compared to unshocked samples provides a direct indication of shock-induced particle comminution, agglomeration or morphology changes. Low-temperature thermal pretreatment is found to give reliable values and also reveals chemical change at the surfaces. Al_2O_3 and A1N show relatively modest (20 to 40%) increases in specific surface at low shock pressure with a subsequent decrease on the order of 50% at higher pressure. In contrast, TiC and TiB_2 show increases in specific surface up to 75% and 200%, respectively, at the higher pressures.

49516 **(UCRL—89444) Structure and vibrational spectra of a model of a-Si:H with periodic boundary conditions.** Winer, K.; Wooten, F. (Lawrence Livermore National Lab., CA (USA); California Univ., Davis (USA). Dept. of Applied Science). Aug 1983. Contract W-7405-ENG-48. 6p. (CONF-830895—1). NTIS, PC A02/MF A01. Order Number DE83015245.

From 10. international conference on amorphous and liquid semiconductors; Tokyo, Japan (22 Aug 1983).

A ball-and -stick model of a-Si:H with periodic boundary conditions has been constructed. A computer replica of the structure has been relaxed and the density, radial distribution function and vibrational spectra calculated.

49517 **Unusual cell volume behavior in the LaNbsub(1-x)Vsub(x)O_4 system.** Aldred, A.T. (Argonne National Lab., IL (USA)). *Materials Letters;* 1: No. 5-6, 197-199(Apr 1983).

The crystal structures and lattice constants of the LaNbsub(1-x)Vsub(x)O_4 system have been determined at room temperature. The system undergoes a monoclinic to tetragonal phase transformation with an increase in x analagous to the transition as a function of temperature in pure $LaNbO_4$. The unit cell volume increases with an increase in x in the monoclinic phase despite the fact that vanadium is a smaller ion than niobium. A more normal contraction of the cell volume is observed in the tetragonal phase. The origin of this unusual behavior is unclear at present.

3603 Composite Materials

49518 **(DOE/ER/10937—2) Fracture mechanisms in glass-crystal composites. Progress report.** Hasselman, D.P.H. (Virginia Polytechnic Inst. and State Univ., Blacksburg (USA). Dept. of Materials Engineering). 30 May 1983. Contract AS05-81ER10937. 10p. NTIS, PC A02/MF A01. Order Number DE83015989.

The microhardness indentation method was used for the study of the introduction of cracks to simulate the introduction of surface flaws during handling, grinding or other mechanical surface preparation techniques encountered in practice. Subcritical crack growth was studied using the double-torsion method. Critical crack propagation, including the strain-rate sensitivity, was studied by strength measurements using the biaxial ring test.

3604 Polymers And Plastics

REFER ALSO TO CITATION(S) 48676, 49598

49519 **(BMFT-FB-T—83-087) Electrochemical-treeing (ECT)-structures in high-voltage cable insulation.** Henkel, H.J.; Mueller, N.; Kalkner, W.; Hans, H.; Sander, G.; Olshausen, R. v.; Vogel, U. (Bundesministerium fuer Forschung und Technologie, Bonn (Germany, F.R.)). May 1983. 109p. (In German). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83751099.

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"Electrochemical-treeing (ECT)" structures are the result of changes occuring in electrically stressed polyolefin insulation. They may be of relevance w.r.t. the service reliability of PE- and XLPE-insulated power cables. The mechanisms of ECT growth are not yet fully understood. With the aid of improved dyeing and microscopic techniques the influence of ambient conditions, of the type of insulation and of the cross-linking technique were investigated. ECT-structures produced under suitably chosen laboratory conditions resemble on the whole those found in cables after years of service. Under the conditions employed, only the stressing field strength had an accelerating influence. Frequency, type of electrolyte and conductor material had no influence. The moisture content of the insulation and of the surroundings influence the growth of ECT-structures. A quantitative comparison of laboratory and field results is not yet possible because of the complex mechanisms involved in ECT-growth. It was shown, that the electrical breakdown strength of PE- and XLPE-insulated model cables decreases with duration of water immersion and of electrical pre-stressing. The results obtained to date show quite clearly, that the prematurely terminated research should be continued in order to fully understand the phenomenon and to find means of effectively suppressing it.

49520 **(SAND—83-0641) Polyimides for use in integrated circuits.** Schubert, W.K. (Sandia National Labs., Albuquerque, NM (USA)). May 1983. Contract AC01-80PE70039. 28p. NTIS, PC A03/MF A01. Order Number DE83016769.

The electrical properties of thin polyimide films have been investigated to determine their suitability for use as insulators in integrated circuits manufactured at Sandia. The primary experiments carried out were capacitance-voltage measurements, bias-temperature stress testing and current-voltage measurements as a function of temperature. Bias-temperature stressing causes significant charging in metal-polyimide-silicon dioxide-silicon capacitors. The mechanism involved is apparently high temperature electron transport in the polyimide and subsequent trapping at the polyimide-SiO_2 interface. The specific conduction mechanisms in polyimide are quite complex and remain unspecified. Considerable variability in the electrical characteristics from sample to sample was also observed. These results indicate serious problems which must be dealt with if polyimides are to be used in integrated circuits.

49521 **(SAND—83-1244) Dielectric breakdown of MXB-71 phenolic and Sylgard 184/GMB silicone at high temperature.** Johnson, R.T. Jr.; Beeson, P.M. (Sandia National Labs., Albuquerque, NM (USA)). Jul 1983. Contract AC04-76DP00789. 17p. NTIS, PC A02/MF A01. Order Number DE83016768.

High temperature electrical breakdown characteristics have been determined for MXB-71 phenolic and Sylgard 184/GMB silicone in air and nitrogen environments. The phenolic material is used for electronic case housings whereas the silicone is an encapsulant. The experiments were performed with constant electric fields (values ranging from 3×10^3 to 2.5×10^4 V/cm) applied to the samples while the temperature was increased at a rate of 10°C/minute. The sample current until breakdown was determined. Results showed that breakdown occurred between 470 to 725°C, and was principally dependent upon the material conductivity at time breakdown and the electric field. The breakdown temperature decreased with increasing electric field and decreased in an oxygen-containing environment. Materials postcured at 580 to 600°C prior to electrical testing exhibited considerably lower breakdown temperatures at higher electric fields. Results suggest that breakdown occurred via thermal runaway.

49522 **(SAND—83-1592C) Origin of pyroelectricity in polyvinilydene fluoride.** Kepler, R.G.; Anderson, R.A.; Lagasse, R.R. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 17p. (CONF-830784—1). NTIS, PC A02/MF A01. Order Number DE83015227.

From US/Japan seminar on piezoelectric polymers; Honolulu, HI, USA (17 Jul 1983).

The experimental observations indicate that reversible changes in crystallinity contribute significantly to the magnitude of the pyroelectric effect.

3606 Other Materials

REFER ALSO TO CITATION(S) 48676, 48682, 48683, 48696, 48727, 48818, 48819, 48820, 48821, 48822, 48823, 48824, 48825, 48826, 48827, 48828, 48829, 48830, 48831, 48832, 48833, 49195, 49312, 49312, 50317

49523 (BMFT-FB-T—83-061) Materials characterization of silicon and analysis of recombination processes and impurities. Schmid, W.; Wagner, J.; Weber, J. (Bundesministerium fuer Forschung und Technologie, Bonn (Germany, F.R.)). Apr 1983. 52p. (In German). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83751092.

The physical properties of "shallow" impurities in silicon, e.g. P and B, which are used to control the electrical conductivity are basically well understood. Therefore the so-called "deep" centers with energy levels far away from the band edges attracted increasing interest. "Deep" centers are always present in the crystals. They are partly built in during crystal growth and partly during device processing. "Deep" levels can seriously influence materials parameters especially the carrier lifetime. It was the purpose of this project to prove that photoluminescence which is a powerfull tool in investigating "shallow" impurities can also give substantial information about "deep" centers. The experiments were started with transition metals in silicon since they are of the major practical importance. New and characteristic emissions were observed in the low temperature photoluminescence spectra. It was verified that the transition metals tend to form complexes with the group-III-acceptors. By time-resolved spectroscopy the influence of "deep" centers on the carrier lifetime was studied. Since this project has proven that photoluminescence is a powerfull technique to investigate "deep" centers in silicon it will be applied systematically on a variety of centers in a subsequent project.

49524 (BNL—33440) Optical emission and mass spectrometer studies of plasma deposition. Kampas, F.J.; Corderman, R.R. (Brookhaven National Lab., Upton, NY (USA)). 1983. Contract AC02-76CH00016. 4p. (CONF-830895—2). NTIS MF A01. Order Number DE83016700.

From 10. international conference on amorphous and liquid semiconductors; Tokyo, Japan (22 Aug 1983).

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Optical emission spectroscopy and mass spectrometry provide complementary information about glow-discharge deposition processes. Emission intensities can be used to determine dependences of electron concentration and energy distribution on discharge parameters. Measurement of concentrations of chemical species in the discharge by mass spectrometry leads to chemical kinetic models of polymerization processes.

49525 (BNL—33451) Radiation induced F-center and colloid formation in synthetic NaCl and natural rock salt: applications to radioactive waste repositories. Levy, P.W.; Loman, J.M.; Kierstead, J.A. (Brookhaven National Lab., Upton, NY (USA)). 1983. Contract AC02-76CH00016. 28p. (CONF-830575—5). NTIS, PC A03/MF A01. Order Number DE83016732.

From Spring meeting of the Japan Society of Corrosion Engineers; Tokyo, Japan (18 May 1983).

Radiation damage, particularly Na metal colloid formation, has been studied in synthetic NaCl and natural rock salt using unique equipment for making optical absorption, luminescence and other measurements during irradiation with 1 to 3 MeV electrons. Previous studies have established the F-center and colloid growth phenomenology. At temperatures where colloids form most rapidly, 100 to 250 C, F-centers appear when the irradiation is initiated and increase at a decreasing rate to a plateau, reached at doses of 10^6 to 10^7 rad. Concomitant colloid growth is described by classical nucleation and growth curves with the transition to rapid growth occurring at 10^6 to 10^7 rad. The colloid growth rate is low at 100 C, increases markedly to a maximum at 150 to 175 C and decreases to a negligible rate at 225 C. At 1.2×10^8 rad/h the induction period is $>10^4$ sec at 100 C, <3000 sec at 150 to 175 C and $>10^4$ sec at 275 C. The colloid growth in salt from 14 localities is well described by C(dose)/sup n/ relations. Data on WIPP site salt (Los Medanos, NM, USA) has been used to estimate roughly the colloid expected in radioactive waste repositories. Doses of 1 to 2×10^{10} rad, which will accumulate in salt adjacent to lightly shielded high level canisters in 200 to 500 years, will convert between 1 and 100% of the salt to Na colloids (and Cl) if back reactions or other limiting reactions do not occur. Each high level lightly shielded canister may ultimately be surrounded by 200 to 300 kg of colloid sodium. Low level or heavily shielded canisters may produce as little as 1 kg sodium.

49526 (CONF-8305100—7) Chemical reactions among the components in $SbCl_3$-$AlCl_3$-Sb melts. Smith, G.P.; Buchanan, A.C.; Sorlie, M.; Mamantov, G. (Oak Ridge National Lab., TN (USA); Tennessee Univ., Knoxville (USA). Dept. of Chemistry). 1983. Contract W-7405-ENG-26. 26p. NTIS, PC A03/MF A01. Order Number DE83014048.

From 4. Electrochemical Society international symposium on molten salts; San Francisco, CA, USA (8 May 1983).

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Although mixtures of $SbCl_3$, $AlCl_3$ and Sb metal are unreactive and mutually insoluble in the solid state, the electrical conductivity of molten $SbCl_3$-$AlCl_3$ mixtures and the substantial solubility of Sb metal in these molten mixtures show that reactions occur in the liquid state. We review research on these and related subjects in an effort to gain insight into what the underlying reactions might be. 23 references, 5 figures.

49527 (DOE/JPL—1012-81, pp 127-140) Mechanism of the chemical vapor deposition of carbon in a fluidized bed of particles. Kaae, J.L. (General Atomic Co., San Diego, CA). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

After a discussion of the relevance of chemical vapor deposition of carbon in a fluidized bed to the process of silicon production, the conditions of deposition are briefly discribed. Changes in structure with deposition rate and temperature and variations in the microstructure with deposition rate are discussed. The deposition mechanism is then described. (LEW)

49528 (DOE/JPL—1012-81, pp 141-158) Model for the growth of dense silicon particles from silane pyrolysis in a fluidized bed. Fitzgerald, T.J. (TRW Energy Development Group, Redondo Beach, CA). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

This paper attempts to model the decomposition of silane in a fluidized bed. In particular, it seeks to reconcile the observed performance of actual fluidized bed reactors which produce silicon from silane at high concentration, with the generally accepted rates for various physical processes in the bed, notably: heat transfer, particle coalescence, thermophoresis and particle collection. In this model, the chemistry is drastically simplified: the formation of silicon by homogeneous decomposition is considered to be instantaneous, with no intermediates. The silicon will either be present as silane or as silicon metal. It will be seen that reconciling this assumption with reasonable estimates of the various rate processes that occur in the fluidized bed makes it necessary to hypothesize a rather large solid diffusion coefficient in order to produce the dense, coherent plating of silicon onto bed particles which has in fact been observed. A detailed mathematical treatment with all the appropriate partial differential equations will be avoided; rather the attempt will be to find which rate processes are important and must be considered if a detailed model is to be constructed.

49529 (DOE/JPL—1012-81, pp 159-170) Steady-state and transient particle size distribution calculations for fluidized beds. Kayihan, F. (Weyerhaeuser Tech. Center, Tacoma, WA). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

Equations are developed for finite cut particle size distribution calculations in fluidized beds. Steady-state equations are presented for growing and shrinking particles with and without attrition. Alterations in the formulas for simultaneous size and density

changes for two dimensional distributions are also presented. The transient size distribution equations for batch and semi-batch fluidized beds are developed and shown to have easy analytical solutions for reactions that depend on size only.

49530 (DOE/JPL—1012-81, pp 171-189) **Update on a mathematical model which predicts the particle size distribution in a fluidized-bed process.** Grimmett, E.S. (G and R Tech., Idaho Falls, ID). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

Fluidized-bed processes where particles grow or decrease in size are discussed. A previously proposed mathematical model for predicting the particle size distribution in a fluidized bed as a function of time is updated, and a new technique for managing attrition is presented. (LEW)

49531 (DOE/JPL—1012-81, pp 265-276) **Chemical vapor deposition of silicon for optical uses.** Jacobson, M.R.; Booth, D.C.; Hey, P. (Univ. of Arizona, Tucson). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

After a brief review of the history of chemical vapor deposition (CVD), the physical and engineering fundamentals of CVD are introduced. CVD of amorphous silicon (a-Si) for photothermal and photovoltaic uses is discussed. (LEW)

49532 (EFI—479(22)-81) **Reflection spectra of silicon carbide in vacuum ultraviolet region.** Eritsyan, G.N.; Melkonyan, R.A.; Nazaryan, Yu.R.; Oganessyan, A.S.; Sahakyan, A.A.; Tarashchenko, D.T. (Erevanskij Fizicheskij Inst. (USSR)). 1981. 6p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702514.

The reflection spectra of silicon carbide monocrystals of 6H and 15R polytypes are measured in spectral 6.0-9.0 region using the synchrotron radiation as a source. The spectra obtained do not differ much from the optical spectrum of polytype 6H. A characteristic reflection maximum can be found at 7.8 eV, however the reflectance of monocrystals 15R in the longwave part of the spectrum is noticeably higher than that in 6H. The results are compared with the quantum yield measurements.

49533 (FRNC-TH—1095) **Designing and developing a low temperature irradiation experimental device. Study of the effects of electronic irradiation on type N indium arsenide.** Ladjemi, M.T. (Paris-11 Univ., 91 - Orsay (France)). Jul 1982. 141p. (In French). NTIS (US Sales Only), PC A07/MF A01. Order Number DE83702815.

Thesis.

The helium cryostat makes it possible to carry out low temperature irradiation experiments and to measure its effects. Two superconducting coils enable Hall Effect determinations to be made after the irradiations and actually before the material can heat up. The cryostat is fitted with a temperature regulation system enabling the sample to be maintained at any temperature between 4.2 and 300 K, thus making it possible to conduct isochronal and isothermal annealing experiments, precisely for studying the behaviour of defects introduced by the irradiation. Windows are also provided, on a level with the sample, to enable optical experiments to be carried out. Finally, in the cooling system of the sample two circuits have been provided depending on whether the cryostat is used under irradiation or without. The temperature of the sample is determined by means of calibrated resistors. Hence the flexibility in use of the cryostat, its possibilities of adaptation to the experiments and to the aims sought, and the wide temperature range within which it can work, make this instrument a powerful and new method. A part of the work covers the study of the effect of electronic irradiation (3 MeV) at 0°C and at 20K. The density of the donor centres introduced is determined quantitatively. This density is studied in terms of the electronic flux and the temperature at which the irradiations are carried out. The rate of introduction of defects is analyzed and discussed, in the samples irradiated at 0°C, depending on the Fermi level. The thermal treatments (isochronal annealings) make it possible to study the behaviour of the defects introduced and their cure depending on temperature.

49534 (IA—1369) **Effect of cadmium doping of Pbsub(1-x)Snsub(x)Te crystals and thin layers on the electrical properties of the system.** Silberg, E. (Weizmann Inst. of Science, Rehovoth (Israel)). Jun 1982. 101p. (In Hebrew). NTIS (US Sales Only), PC A06/MF A01. Order Number DE83702252.

Thesis.

In the present work the doping characteristics and electrical properties of Cd-doped bulk crystals (as-grown and annealed) and LPE layers of Pbsub(1-x)Snsub(x)Te, $0<=x<=0.25$, were studied using Hall effect, resistivity and Cd-solubility measurements. The bulk crystals were doped by Cd-diffusion in a two-temperature-zone furnace and the LPE layers by adding Cd to the growth solution. Cd doping was used to produce uniform n-type LPE layers of Pbsub(1-x)Snsub(x)Te and the process proved to be a controllable and reproducible method for the production of good quality material with low electron concentration and high electron mobility. These qualities are very important in obtaining improved electrooptical devices.

49535 (IA—1371) **New crystalline phases from crystallographic thermal and microscopic studies of alkaline earth sulfites.** Cohen, A. (Bar-Ilan Univ., Ramat-Gan (Israel)). Aug 1981. 164p. (In Hebrew). NTIS (US Sales Only), PC A08/MF A01. Order Number DE83702253.

Thesis.

Different crystalline phases of sulfites of calcium, strontium and barium were obtained by several synthetic methods and under different crystallization conditions. The crystal structures of these products were determined by means of chemical, thermogravimetric, thermodifferential and X-ray powder diffraction analyses, microscopic observation and solubility determinations in aqueous electrolyte solutions.

49536 (IA—1372) **Minority-carriers diffusion length and life-time in LPE grown layers of Pbsub(1-x)Snsub(x)Te.** Shachar, A. (Tel Aviv Univ. (Israel). Dept. of Physics). Nov 1981. 68p. (In Hebrew). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702254.

Thesis.

The minority-carriers diffusion length, L, is measured as a function of temperature between: T=10deg to 110degK. Measurements were carried out on LPE grown layers of Pbsub(1-x)Snsub(x)Te and PbTe both undoped with In or Tl. Using the measured values of L and known values of the mobility, μ, the life-time tau was calculated.

49537 (IA—1375, pp 16) **Hydrogen atom confined within the α-quartz lattice.** Goshen, S.; Friedman, M.; Thieberger, R. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49538 (IA—1375, pp 72) **Neutron diffraction study of the crystallographic and magnetic structures of $KFeBr_3$.** Gurewitz, E.; Shaked, H. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49539 (IA—1375, pp 77-78) **Neutron scattering study of spin waves in the antiferromagnet $RbMnCl_3$.** Alperin, H.A. (Naval Surface Weapons Center, Silver Spring, MD (USA)); Melamud, M. (Israel Atomic Energy Commission, Tel Aviv). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49540 (IA—1375, pp 78-79) **Magnetic structures of $DyCo_2Si_2$ and $DyCu_2Si_2$. A neutron diffraction study.** Pinto, H.; Melamud, M.; Gal, J.; Shaked, H. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49541 (IA—1375, pp 87) **Electrical properties of Cd doped LPE grown PbTe and Pbsub(0.80)Snsub(0.20)Te layers.** Sternberg, Y.; Yellin, N. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49542 (IA—1375, pp 93-94) **Synthesis and crystal growth of chalcogenide spinels.** Gafni, G.; Shaham, H. (Israel Atomic Energy Commission, Tel Aviv); Ben-Dor, L. (Hebrew Univ., Jerusalem (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49543 (IA—1375, pp 94) **Vertical unseeded vapor growth of large CdTe crystals.** Yellin, N.; Eger, D.; Shachna, A. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49544 (IA—1375, pp 94) **Vertical unseeded vapor growth of Ag doped PbTe crystals.** Yellin, N. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49545 (IA—1375, pp 94-95) **Vertical unseeded vapor growth of In and Cd doped PbTe and PbSnTe crystals.** Yellin, N. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49546 (IA—1375, pp 95) **Improved morphology of PbTe epilayers grown by LPE from supercooled growth solutions.** Sternberg, Y.; Yellin, N. (Israel Atomic Energy Commission, Tel Aviv); Ben-Dor, L. (Hebrew Univ., Jerusalem (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49547 (IA—1375, pp 95) **LPE growth of Cd doped PbSnTe.** Sternberg, Y.; Yellin, N. (Israel Atomic Energy Commission, Tel Aviv); Ben-Dor, L. (Hebrew Univ., Jerusalem (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49548 (IA—1375, pp 102-103) **Chemo-abrasive polishing of mercury cadmium telluride (MCT) single crystal wafers.** Goldstein, M.; Horowitz, A.; Makovsky, J. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49549 (IS-M—422) **Intercalate phonon densities of states for alkali-graphite compounds.** Kamitakahara, W.A.; Zabel, H. (Ames Lab., IA (USA); Illinois Univ., Urbana (USA)). Nov 1982. Contract W-7405-ENG-82. 6p. (CONF-821107—57). NTIS, PC A02/MF A01. Order Number DE83016515.

From 6. international symposium on the scientific basis for radioactive waste management (Materials Research Society); Boston, MA, USA (1 Nov 1982).

Neutron scattering methods have been used to determine the partial phonon densities of states g/sub M/(nu) for in-plane vibrations of M atoms in MC/sub x/ compounds, where M = K, Rb or Cs, and x = 8, 24, 36. Only modes with both phonon wave vectors and displacements in the basal plane are represented in g/sub M/(nu). Detailed measurements of the temperature dependence were made for RbC_{24} and KC_{24}, in order to study the influence of the order-disorder transformations in these compounds. The results are interpreted in terms of different pictures of the disordered state.

49550 (IS-M—423) **Phonon dispersion of transverse basal-plane modes in alkali-graphite compounds.** Kamitakahara, W.A.; Zabel, H.; Nicklow, R.M. (Ames Lab., IA (USA); Illinois Univ., Urbana (USA). Dept. of Physics; Oak Ridge National Lab., TN (USA)). Nov 1982. Contract W-7405-ENG-82. 6p. (CONF-821107—56). NTIS, PC A02/MF A01. Order Number DE83015211.

From 6. international symposium on the scientific basis for radioactive waste management (Materials Research Society); Boston, MA, USA (1 Nov 1982).

Dispersion curves for low-frequency transverse modes propagating in the basal plane have been measured in the compounds KC_8, KC_{24} and RbC_{24} by means of neutron inelastic scattering. The acoustic branches show at low q a behavior $\omega^2 = Aq^2 + Bq^4$ characteristic of layered materials. The optical branches are derived qualitatively from graphite-like optical branches hybridized with new alkali-like branches. In stage 2 compounds, the shear constant C_{44}, which can be obtained by extrapolating the acoustic branch towards $q = 0$, is appreciably smaller than in stage-1 compounds or in pure graphite. At low temperatures, it was noted in KC_{24} that a frequency gap in the acoustic branch opens up near $q = 0.6\ A^{-1}$, corresponding to the Brillouin zone boundary of the low temperature alkali superstructure.

49551 (KFTI—81-51, pp 73-74) **Effect of different kinds of radiation on the elastic and optical properties of quartz crystals.** Zubov, V.G.; Firsova, M.M.; Shtyrkova, A.P.; Glushkova, T.M. (Moskovskij Gosudarstvennyj Univ. (USSR)). 1981. (In Russian). NTIS (US Sales Only), PC A06/MF A01. (CONF-810293—No.3).

From 2. all-union conference on radiation physics of solids; Zvenigorod, USSR (24 Feb 1981).

Investigations are reported of the effects of different radiations (reactor, electron, and γ included) on the elastic and optical properties of quartz crystals. The acoustic wave velocities V and elastic constants Cij have been studied by light diffraction with elastic waves in 8-11 MHz frequency range. The optical properties - index of refraction (lambda=589 nm) have been investigated by Obreimov immersion method and the optical activity (lambda=360-600 nm) using photoelectrical polarimeter. As for dose control immersion densities were determined before and after irradiation. For reactor fluences up to 10^{17} n/cm^2 and for all ranges of γ (10^{10} R) and electron (10^{17} el/cm^2) exposures the changes in densities, elastic and optical properties did not exceed the limit of experimental errors. Only for doses approximately 10^{18} n/cm^2 the effects become measurable, and beginning with the reactor fluences up to $5x10^{18}$ n/cm^2 a rapid, but essentially linear change in velocities of almost all elastic modes was observed. The lack of correlation in dose and temperature dependences of elastic constants c_{11}, c_{33}, c_{44} and c_{66} via the density changes is to be emphasized. The radiation dependence of index of refraction and optical activity for fluences $> 10^{18}$ n/cm^2 revealed to be both linear and unidirected.

49552 (LBL—16216) **Electrical properties of neutron-transmutation-doped germanium.** Rodder, M. (Lawrence Berkeley Lab., CA (USA)). Aug 1982. Contract AC03-76SF00098. 73p. NTIS, PC A04/MF A01. Order Number DE83016693.

Thesis.

Electrical properties of neutron-transmutation-doped germanium (NTD Ge) and nearly uncompensated gallium-doped germanium have been measured as functions of net-impurity concentration ($2 \times 10^{15}cm^{-3} \leqq$ N/sub A/ - N/sub D/ $\leqq 5 \times 10^{16}cm^{-3}$) and temperature (0.3 K $\leqq$ T $\leqq$ 300 K). The method of impurity conduction as a function of carrier concentration and compensation was investigated in the low temperature hopping regime. For nearest neighbor hopping, the resistivity is expected to vary as rho = $rho_0exp(\Delta/T)$ while Mott's theory of variable range hopping predicts that rho = $rho_0exp(\Delta/T)$/sup 1/4/ in the low temperature limit. In contrast, our results show that the resistivity can best be approximated by rho = $rho_0exp(\Delta/T)$/sup 1/2/ in the hopping regime down to 0.3 K.

49553 (LBL—16234) **Optical and magnetic properties of uranium and neptunium borohydrides and tetrakismethylborohydrides.** Rajnak, K.; Gamp, E.; Banks, R.; Shinomoto, R.; Edelstein, N. (Lawrence Berkeley Lab., CA (USA)). Jun 1983. Contract AC03-76SF00098. 28p. (CONF-8309124—1). NTIS, PC A03/MF A01. Order Number DE83015935.

From 1. international onference on the chemistry and technology of the lanthanides and actinides; Venice, Italy (5 Sep 1983).

The optical and magnetic properties of $M(BH_3R)_4$ (M = U, Np; R = H, CH_3) have been determined and the data fit with the

parameters of an empirical Hamiltonian. Reasonable fits to the optical data are obtained, but in order to fit the magnetic susceptibility and EPR data, orbitual reduction factors of ~ 0.8 to 0.9 must be used.

49554 **(SAND—83-0294C) Effects of pressure on deep electronic levels in semiconductors.** Samara, G.A.; Barnes, C.E. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 4p. (CONF-830763—11). NTIS, PC A02/MF A01. Order Number DE83016247.

From 9. AIRAPT conference; Albany, NY, USA (25 Jul 1983).

The effects of hydrostatic pressure on the properties of deep electronic levels in semiconductors were investigated using the techniques of transient capacitance spectroscopy. Results on the gold acceptor level in Si and the deep A and B hole traps in LPE GaAs are presented and discussed to illustrate the usefulness of such studies.

49555 **(SAND—83-0974C) Numerical modeling of dynamic material response.** Davison, L. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 7p. (CONF-830719—36). NTIS, PC A02/MF A01. Order Number DE83016233.

From American Physical Society meeting on shock waves in condensed media; Santa Fe, NM, USA (18 Jul 1983).

Most analyses of the propagation of shock waves in condensed matter are based on the continuum approximation, and are conducted numerically. This approach not only lends itself to the solution of practical problems in complex geometrical settings but also permits analyzing the physical response of materials in considerable detail, using theories of corresponding complexity. The responses of condensed matter to shock compression vary widely, with the greatest variation being manifest in the regime of moderate compression - that in which inelastic effects are dominant and subtle changes in material microstructure have a significant influence on mechanical responses. Materials of interest cover the range from simple liquids and monocrystals to the most complex natural and synthetic composites. They exhibit viscoelasticity, plasticity, viscoplasticity, compaction, phase transformation, electromagnetic activity, chemical decomposition, fracture, fragmentation, and other responses. In many cases, these responses involve nuances unique to the shock process. A continuum description of these phenomena must be consistent with macroscopic thermomechanical principles, must reflect our knowledge of the microscopic basis of the phenomena to be represented, and must appear in a form that lends itself to computation. Recent theoretical studies of structured mixtures and continuua having evolving internal state variables has opened the way to further progress in this area. These issues are discussed generally and are illustrated by examples.

49556 **(ZfK—481) Investigations on the homogeneity of silica glass and on the order of X-amorphous silica by luminescence measurements.** Boden, G. (Zentralinstitut fuer Kernforschung, Rossendorf bei Dresden (German Democratic Republic)). Aug 1982. 71p. (In German). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702519.

Silica glasses melted from crystalline SiO_2 were exposed to ionizing radiation. At room temperature the spatial intensity distribution of the emitted luminescent radiation has been recorded by means of photographic or autoradiographic materials. Thereby schlieren and inhomogeneities are made visible and information is obtained on the melting process of the crystalline SiO_2. Synthetic fused silica made from $SiCl_4$ shows no luminescent radiation. Depending on the penetration depth of the ionizing radiation the bulk or the surface of the sample can be studied. The decay curves of the integral luminescence intensity yield data on inhomogeneities in the silica glass leading to conclusions on order state and structure. The luminescence intensity and its half-life are a measure for the inhomogeneity of the silica glass and the existence of so-called 'preordered states'. This connection between luminescence intensity and the order state is also foundp with other X-amorphous SiO_2 modifications: silica gel, precipitated silicic acids, porous SiO_2 glasses, aerosil, thin SiO_2 layers, mechanically activated quartz: whereas no luminescence phenomena occur in disordered nearly ideally amorphous SiO_2 species, the luminescence increases with increasing order degree of the SiO_2 network and attains a high intensity in the case of the crystalline SiO_2 modifications quartz and cristobalite.

49557 **(KFK-tr—659) Application of the viscosity formulas of E. Andrade and S. Khaikin for salt melts.** Leont'eva, A.A. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Stabsabteilung Internationale Beziehungen). Jan 1981. Translation source information not available . 16p. (In German). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780870.

Published in Zh. Fiz. Khim., 11(3), 310-316 (1938).

In the case of associated salt melts such as $NaPO_3$, $Na_2B_4O_7$-B_2O_3, Na_2O-SiO_2 and $K_2B_4O_7$-B_2O_3 the theory of Andrade agrees well with experimental findings. One exception is $Na_2B_4O_7$ in the case of which the melting point separates two regions of the viscose fluid. For all salt melts the equation of S. Khaikin however is only valid in individual regions.

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4001 Analytical And Separations Chemistry

REFER ALSO TO CITATION(S) 48540, 48607, 48641, 48670, 50096

49558 **(AEEW-R—1566) Use of the Isomass 54E thermal ionization mass spectrometer at AEE Winfrith. Part 1: uranium analysis.** Knight, A.P. (UKAEA Atomic Energy Establishment, Winfrith). Mar 1982. 33p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702398.

A Vacuum Generators Isomass 54E mass spectrometer is used to carry out isotopic analyses. The capabilities of the instrument and its method of operation are outlined, and the technique used for isotopic analysis of uranium is described in detail, with results of tests on NBS standard specimens and Zebra fuel element pellets.

49559 **(BNL—33370) Application of synchrotron radiation to elemental analysis.** Jones, K.W.; Gordon, B.M.; Hanson, A.L.; Hastings, J.B.; Howells, M.R.; Kraner, H.W.; Chen, J.R. (Brookhaven National Lab., Upton, NY (USA); State Univ. of New York, Geneseo (USA). Coll. of Arts and Sciences). 1983. Contract AC02-76CH00016. 28p. (CONF-830772—5). NTIS, PC A03/MF A01. Order Number DE83016372.

From 3. international conference on particle-induced X-ray emission (PIXE) and its analytical applications; Heidelberg, F.R. Germany (18 Jul 1983).

The use of a synchrotron storage ring as a high brightness source for production of monoergic, variable energy, and highly polarized x-ray beams promises to revolutionize the field of elemental analysis. The results of exploratory work using the Cornell synchrotron facility, CHESS, will be described. Design considerations and features of the new X-Ray Microprobe Facility now under construction at the Brookhaven National Synchrotron Light Source will be presented. This facility will be used for bulk analysis and for microanalysis with an initial spatial resolution of the order of 30 μm.

49560 **(EGG-M—00883) Determination of radium-226 by high-resolution alpha spectrometry.** Sill, C.W. (EG and G Idaho, Inc., Idaho Falls (USA)). 1983. Contract AC07-76ID01570. 55p. (CONF-830695—7). NTIS, PC A04/MF A01. Order Number DE83014959.

From Health Physics Society annual meeting; Baltimore, MD, USA (19 Jun 1983).

The determination of radium-226 by alpha spectrometry has been investigated critically to determine experimental conditions under which high resolution and accurate and reliable results can be obtained. Refractory solids such as soils, ores, and tailings from uranium mills are dissolved completely by fusion with potassium fluoride in the presence of barium-133 tracer. The fluoride cake is then transposed with sulfuric acid to a pyrosulfate fusion with simultaneous volatilization of all silica and fluoride. Radium is precipitated with barium already present in the sample by addition of

lead perchlorate to a dilute hydrochloric acid solution of the pyrosulfate cake. The resulting insoluble sulfates are dissolved in an alkaline solution of diethylenetriaminepentaacetic acid, and the radium and barium sulfates are reprecipitated with acetic acid. The precipitate is mounted on a membrane filter and analyzed by alpha spectrometry. Water samples are partially evaporated and treated similarly. Resolution of the subsequent alpha spectra is much better than has been achieved previously from barium sulfate, and is almost as good as is obtainable with actinides electrodeposited on polished steel plates. The resolution is about 60 keV full-width-half-maximum with 100 μg of barium on a 1-inch filter with a 450 mm^2 detector at 20% counting efficiency. Recovery is about 97% and accuracy is generally as good as the counting statistics obtained will permit. Grossly inaccurate results can be obtained under certain conditions when barium-133 tracer is used to determine the chemical yield of radium-226. Severe contamination of the surface-barrier detector by polonium-210 and by recoil products of the radium isotopes being counted is demonstrated, amd methods for virtual elimination of both problems are discussed.

49561 (IA—1375, pp 175-176) **Mechanism of selective transport of water and salt through modified microporous reverse osmosis membranes.** Katz, M.G. (Israel Atomic Energy Commission, Tel Aviv); Wydeven, T. (National Aeronautics and Space Administration, Moffett Field, CA (USA). Ames Research Center). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49562 (IS-M—419) **Simplified methodology for PAHs on suspended particles.** Avery, M.J.; Richard, J.J.; Junk, G.A. (Ames Lab., IA (USA)). 1983. Contract W-7405-ENG-82. 2p. (CONF-8305121—1). NTIS, PC A02/MF A01. Order Number DE83016345.

From 31. annual conference on mass spectrometry and allied topics; Boston, MA, USA (8 May 1983).

Accurate quantitative data for selected polycyclic aromatic hydrocarbons present on urban dust can be obtained by using a simple procedure consisting of: sonic probe extraction with cyclohexane; clean-up with Florisil-XAD-2, and measurement with high resolution gas chromatography and flame ionization detection (HRGC/FID). The analysis can be further simplified by eliminating the clean-up step if HRGC/electron impact mass spectrometry (MS) is available. Both the FID and MS methods give results consistent with those obtained by time-consuming standard procedures. The direct HRGC/MS procedure, combined with chemical ionization, can also be applied to the determination of polycyclic organic materials present in solvent refined coal, shale oil and crude oil.

49563 (IS-M—421) **Extraction of platinum(IV) with supported liquid membrane containing trioctylamine carrier.** Nishiki, T.; Bautista, R.G. (Ames Lab., IA (USA)). 1982. Contract W-7405-ENG-82. 6p. (CONF-821251—1). NTIS, PC A02/MF A01. Order Number DE83015892.

From Symposium on solvent extraction; Hamamatsu, Japan (10 Dec 1982).

A trioctylamine-supported liquid membrane was applied to separation and concentration of platinum. Platinum was transported and concentrated from the hydrochloric acid solution to the sodium carbonate solution across the membrane. The effects of the concentration of TOA and those of platinum in the feed and stripping solutions on the permeation rate are clarified. The mechanism of platinum transport through the membrane is discussed based on a simple permeation model.

49564 (IS-M—425) **Synergic extraction of $Sm(NO_3)_3$ and $Gd(NO_3)_3$ by a mixture of tributyl phosphate and Aliquat 336 in AMSCO and ammonium nitrate medium.** Huang, C.H.; Bautista, R.G. (Ames Lab., IA (USA)). 1983. Contract W-7405-ENG-82. 24p. (CONF-830633—6). NTIS, PC A02/MF A01. Order Number DE83016516.

From 3. symposium on separation science and technology for energy applications; Gatlinburg, TN, USA (27 Jun 1983).

The synergic extraction of Sm and Gd using a mixture of tributyl phosphate and Aliquat 336 is presented. The influence of diluents, salting-out agents and acidity on the synergic extractions have been investigated. The separation factor of Sm and Gd was found to be larger than 3. This is one of the best systems for the separation of Sm and Gd. NH_4NO_3 was found to be extracted by pure TBP or pure Aliquat 336, but cannot be extracted by a mixture of TBP and Aliquat 336.

49565 (IS-T—1046) **Design and synthesis of some polyaminopolycarboxylic acids and the structural influence of their anions on the separation of actinides and lanthanides.** Tse, P.K. (Ames Lab., IA (USA)). Jun 1983. Contract W-7405-ENG-82. 128p. NTIS, PC A07/MF A01. Order Number DE83016117.

Thesis.

Investigation of some methods for the preparation of four polyaminopolycarboxylic acids: thiobis(ethylenenitrilo)-N,N,N′,N′-tetraacetic acid, N,N-bis(2-aminoethyl)aniline-N′,N′,N″,N″-tetraacetic acid, bis (3-amino-propyl)ether-N,N,N′,N′-tetraacetic acid and N,N-bis [N′,N′-dicarboxymethyl-3-aminopropyl]-N-methylammonioacetate are reported. The coordinating properties of their anions with regard to lanthanide ions have been examined. Polyaminopolycarboxylates form 1:1 chelate species with trivalent lanthanide ions in aqueous media. The stability constants of their metal chelate species depend upon the size the chelating rings formed, the basicity of the middle atom in the chain, and the number of coordination points between anion and metal cation. Tracer level ^{241}Am-^{155}Eu cation-exchange experiments explore how the relative magnitude of the chelate stability constants affects the separation of members of the lanthanide and actinide series.

49566 (IS-T—1072) **Laser-based optical-activity detector for high-performance liquid chromatography.** Kuo, J.C. (Ames Lab., IA (USA)). Jun 1983. Contract W-7405-ENG-82. 151p. NTIS, PC A08/MF A01. Order Number DE83016118.

Thesis.

The identification of chromatographic peaks is simplified when detection is based on the rotation of polarized light by optically active molecules. The working system is based on the use of a laser and high quality optics. A detection limit approaching that of the conventional uv absorption detector can be achieved in a small volume flow cell. Three specific applications are discussed: in human urine, the determination of various sugars; in human plasma, the determination of the lipid profile; and the fractionation of shale oil, having different particle sizes and from different sources.

49567 (JINR—R-12-82-64) **Possibility of gas chemical identification of superheavy elements.** Zhujkov, B.L. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Reactions). 1982. 16p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702306.

A method for gas-chemical isolation from natural samples as well as for identification of superheavy elements (SHE) in the z=108-116 region is suggested, including sublimation in a hydrogen stream (z=112-116), oxygen stream (108-110), absorption of elements 115 and 116 by CaO-filter (1100 deg C) in oxygen and thermochromatographic separation in hydrogen. Isolation of fractions of some analogues of SHE from a few samples obtained from the Cheleken peninsula geothermal waters is carried out. The isolation include purification from As, Mo, Pb, Zn and other volatile microcomponents by using CaO, SiO_2 and liquid Al filters. Ultrathin and pure targets (without U) are prepared and used for SHE searching by the method of induced fission on the cyclotron α-particle beam.

49568 (LBL—15828) **Simultaneous stripping and extraction for recovery of ammonia from sour water.** Mackenzie, P.D.; King, C.J. (Lawrence Berkeley Lab., CA (USA)). Mar 1983. Contract AC03-76SF00098. 13p. (CONF-830808—8). NTIS, PC A02/MF A01. Order Number DE83015958.

From International solvent extraction conference; Denver, CO, USA (26 Aug 1983).

Liquid cation exchangers extract ammonia effectively from aqueous ammonium bicarbonate solutions. D2EHPA is an effective extractant for ammonia. Compounds with available OH groups are desirable modifiers to add to the diluent for D2EHPA, subject to the need for sustaining sufficient NH_3 volatility for regeneration. Si-

multaneous stripping and selective solvent extraction of an aqueous solution of NH_3 and CO_2 does produce the desired results of enhanced CO_2 volatility and isolation of NH_3 from CO_2.

49569 **(MLM—3085) Calorimeter operating system implemented on a Z-80 microcomputer in read only memory.** Wetzel, J.R. (Monsanto Research Corp., Miamisburg, OH (USA). Mound). 29 Jul 1983. Contract AC04-76DP00053. 94p. NTIS, PC A05/MF A01. Order Number DE83016647.

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The operations necessary for nondestructive, calorimetric determination of the power in watts of a radioactive sample were implemented on a Z-80 based microprocessor. The resulting system reduces the size of the analyzer electronics and determines the sample value independent of operator calculations. The time required for analysis is reduced approximately 40% using the prediction of equilibration technique. The system is capable of running in stand-alone mode or in the remote in communication with a minicomputer. All running operations can be controlled remotely from the minicomputer over an RS-232 serial communications link. This package reduces the cost of the electronics by some $7000 to $10,000 while maintaining a 0.5 μV out of 1.0 V resolution. This report describes the Z-80 microprocessor and associated equipment used.

49570 **(PB—83-196667) Simplified scheme for the analysis of pollutants in groundwater and leachates contaminated by hazardous chemicals.** Manahan, S.E. (Missouri Univ., Columbia (USA). Water Resources Research Center; Office of Water Research and Technology, Washington, DC (USA)). 30 Sep 1982. 58p. NTIS, PC A04/MF A01.

The overall objective of the research was the development of a solvent-based separation procedure for the fractionation of organic pollutants from a hazardous waste source in water into hydrophilic; insoluble (suspended); and organophilic acid, base, and neutral fractions. The fractions may be characterized at the simplest level by dissolved organic carbon analysis, leaving open the option for more sophisticated gas chromatographic and gas chromatographic/mass spectrometric analysis. The separation and analysis procedures have been proved on a variety of organic compounds obtained as by-products of underground coal gasification.

49571 **(PB—83-199646) Determination by x-ray-fluorescence spectrometry of gold and uranium on resin.** Jacobs, J.J.; Balaes, A.M.E. (Council for Mineral Technology, Randburg (South Africa)). 4 Feb 1983. 25p. NTIS, PC A03/MF E01.

The problems encountered in the determination of gold and uranium that are present simultaneously in a sample of resin were considered, and new background positions, as well as correction factors for background lift and partial spectral overlap, were determined for use in the X-ray-fluorescence measurement of these elements. The procedure is intended primarily for use in the rapid determination of gold and uranium when no analyses for other elements are required. The time taken for the analysis is 2 hours for 10 samples when 6 standards are used. A computer program that was developed for the processing of the data is appended as part of a laboratory method.

49572 **(PB—83-205344) Preparation and certification of a uranium reference material.** Hansen, R.G.; Ring, E.J. (Council for Mineral Technology, Randburg (South Africa)). 25 Feb 1983. 15p. (MINTEK-M—84). NTIS, PC E03/MF E01.

This report describes the preparation, analysis, and certification of a bulk sample of low-grade uranium ore for use as a reference material. An investigation into its state of radioactive equilibrium established that the material is suitable for the purpose for which it is primarily intended, i.e. the calibration of radiometric sorting equipment on mines. Eleven South African laboratories, using several well-established analytical techniques, contributed data on the uranium content of the material.

49573 **(ZfI-Mitt—52, pp 5-26) Non-destructive determination of depth profiles with the aid of X-ray fluorescence analysis.** Roessiger, V. Jul 1982. (In German). NTIS (US Sales Only), PC A04/MF A01.

In Application of the isotopic index in isotope geochemical investigation.

Depth profiles of Ni/Fe-foils (5...20 μm thick) are determined by means of X-ray fluorescence analysis (XRF). The main prerequisite for applying this technique consists in a precise description of X-ray production. In media with depth dependent composition the enhancement effect plays an important role. If the foil thickness is of the order of the relaxation length of fluorescence radiation the measurements should be carried out both in reflection and in transmission and from both sides of the foil to get maximum information on the unknown concentration profile. The thickness of the foil may be gaged independently and simply by an absorption technique. For this reason only ratios (and not absolute values) of the X-ray yields should be determined in the experiment. In addition to this practical simplification, the averaged composition of the foil is obtained which is suitable for controlling XRF-profiling results.

4002 Inorganic And Physical Chemistry

REFER ALSO TO CITATION(S) 48579, 48771

49574 **(AD-A—126726/9) Comparisons between theoretical and experimental deuterium isotope effects for some outer-sphere electrochemical reactions. Technical report.** Weaver, M.J.; Li, T.T.T. (Purdue Univ., Lafayette, IN (USA). Dept. of Chemistry). Mar 1983. 18p. (TR—13). NTIS, PC A02/MF A01.

Experimental deuterium isotope effects upon the rates of outer-sphere electrochemical exchange reactions involving aquo and ammine complexes are compared with the predictions of contemporary theories which take into account nuclear tunneling from inner-shell vibrational modes. The isotope rate ratios calculated by considering nuclear tunneling of metal-ligand vibrational modes are in most cases much smaller than the observed rate ratios. Significant additional contributions may arise from nuclear tunneling associated with internal ligand stretching modes, although this is estimated to be unlikely to account for the very large isotope effect observed for hexaaquochromium(III)/(II). The disparities seen between theory and experiment are speculated to be due to a contribution to the outer-shell reorganization energy from reorientation of hydrogen-bound solvent molecules. This conclusion is supported by the marked disparities seen between the relative isotope rate ratios for corresponding electrochemical and homogeneous reactions in comparison with the predictions of the dielectric continuum model.

49575 **(AD-A—127052/9) Properties of reactive species generated at high temperatures and their low temperature reactions to form novel substances. Final report.** Skell, P.S. (Pennsylvania State Univ., University Park (USA); Air Force Office of Scientific Research, Washington, DC (USA)). 1983. 13p. NTIS, PC A02/MF A01.

Reactions of iron, cobalt, nickel, palladium and zirconium atoms with unsaturated hydrocarbons are described. Preliminary studies of a number of other atoms are described: Th, Rh, Nb, Ta.

49576 **(AD-A—129113/7) Thermophysical properties of matter, the TPRC data series. Volume 10. Thermal diffusivity. Data book.** Touloukian, Y.S.; Powell, R.W.; Ho, C.Y.; Nicolaou, M.C. (Purdue Univ., Lafayette, IN (USA). Thermophysical and Electronic Properties Information Center). 1974. 764p. Plenum Publishing Corp., 227 W. 17th St., New York, NY 10011 HC $75.00 (Available in microfiche only from DTIC).

The TPRC Data Series published in 13 volumes plus a Master Index volume constitutes a permanent and valuable contribution to science and technology. This 17,000 page Data Series should form a necessary acquisition to all scientific and technological libraries and laboratories. These volumes contain an enormous amount of data and information for thermophysical properties on more than 5,000 different materials of interest to researchers in government laboratories and the defense industrial establishment. Volume 10 in this 14 volume TPRC Data Series covers 76 metallic and nonmetallic elements; 25 groups of nonferrous binary alloys; 28

groups of nonferrous multiple alloys; 10 groups of ferrous alloys; three intermetallic compounds; 13 simple oxides; eight complex oxides and salts; 17 groups of mixtures of oxides; 28 nonoxide compounds; 14 groups of mixtures of nonoxides; four minerals and rocks; four systems; nine refractory minerals, processed composites and glasses; four organic compounds; 16 polymers; and 22 foods and biological synthesized, and recommended reference values or provisional values are presented in addition to the original experimental data.

49577 **(BNL—33293) Spectral and kinetic properties of the products resulting from reactions of HO_2/O_2^- with manganese(II) complexes.** Bielski, B.H.J.; Arudi, R.L.; Cabelli, D.E. (Brookhaven National Lab., Upton, NY (USA)). 1983. Contract AC02-76CH00016. 15p. (CONF-830785—1). NTIS, PC A02/MF A01. Order Number DE83014617.

From 3. international conference on oxygen radicals in chemistry and biology; Neuherberg, F.R. Germany (10 Jul 1983).

This investigation was conducted to compare the reactivities of HO_2/O_2^-, $MnO_2^+/MnOOH^{++}$ and Mn^{+++} -pyrophosphate toward some compounds of biological interest; in particular the NADH/NADPH cofactors. Results confirm earlier findings that HO_2/O_2^- form the relatively short lived transient complexes $MnO_2^+/MnOOH^{++}$ in reactions with weakly complexed Mn^{++}. In presence of strong complexing ligands like pyrophosphate the observed endproducts are Mn(III) - complexes. Reactions of the Mn complexes and HO_2/O_2^- with some organic compounds were also studied.

49578 **(DOE/ER/10746—3) Experimental investigation of the ionizations, electronic structure, and bonding of small molecules attached to transition metals. Progress report for year ending February 28, 1983.** Lichtenberger, D.L. (Arizona Univ., Tucson (USA). Dept. of Chemistry). 1983. Contract AC02-80ER10746. 26p. NTIS, PC A03/MF A01. Order Number DE83016378.

The primary experimental technique is gas-phase photoelectron spectroscopy, utilizing HeI, HeII, and X-ray excitation sources. Breakthroughs have been made with the HeI source in observing detailed vibrational structure in metal ionizations. An improved HeII source design was used in study of the valence ionizations of organometallic molecules. Gas phase core photoelectron spectroscopy has also been developed and has shown important correlations between core and valence ionization shifts. The systems receiving most attention during the past year involve metal interactions with small organic molecules and fragments such as alkyls, alkenes, alkynes, methylenes, and vinylidenes. Another important investigation involves carbon-hydrogen bond activation by transition metals in complexes such as cyclohexenyl manganese tricarbonyl. We have also continued our investigations of strong pi-acceptor molecules such as NO, NS, and SO_2 with metals, as well as study of direct metal-metal interactions in quadruply-bonded molecules containing Mo-Mo, W-W, and Mo-W units.

49579 **(DP—1655) Neptunium (IV) oxalate solubility.** Luerkens, D.W. (Du Pont de Nemours (E.I.) and Co., Aiken, SC (USA). Savannah River Lab.). Jul 1983. Contract AC09-76SR00001. 22p. NTIS, PC A02/MF A01. Order Number DE83016116.

The equilibrium solubility of neptunium (IV) oxalate in nitric/oxalic acid solutions was determined at 22°C, 45°C, and 60°C. The concentrations of nitric/oxalic acid solutions represented a wide range of free oxalate ion concentration. A mathematical solubility model was developed which is based on the formation of the known complexes of neptunium (IV) oxalate. the solubility model uses a simplified concentration parameter which is proportional to the free oxalate ion concentration. The solubility model can be used to estimate the equilibrium solubility of neptunium (IV) oxalate over a wide range of oxalic and nitric acid concentrations at each temperature.

49580 **(IA—1375, pp 137-138) Hydrogen isotope exchange in Mg_2Ni deuteride.** Schwarts, I.; Mintz, M.H. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49581 **(IS-M—415) Surface properties of offretite and ZSM-34 zeolites.** Occelli, M.L.; Innes, R.A.; Apple, T.M.; Gerstein, B.C. (Gulf Research and Development Co., Pittsburgh, PA (USA); Iowa State Univ. of Science and Technology, Ames (USA)). 1983. Contract W-7405-ENG-82. 24p. (CONF-830756—9). NTIS, PC A02/MF A01. Order Number DE83016211.

From 6. international zeolite conference; Reno, NV, USA (10 Jul 1983).

Offretite and ZSM-34 zeolites, with nominally the same crystal structure, have been synthesized and their catalytic behavior toward conversion of methanol to hydrocarbons determined. ZSM-34 is found to be highly selective toward conversion to ethylene relative to offretite. Calcination of the two zeolites during removal of the quanternary ammonium cation has been monitored by TGA, DSC, and FTIR. Crystallinity, crystal size, and morphology were studied by powder x-ray diffraction and scanning electron microscopy. Acidities of Bronsted acid sites were monitored by adsorption of pyridine and by observation of changes of infrared spectra with heating and pumping. A variety of experiments on NMR of protons at 220 MHz were performed before and after ammonium and calcination. Possible identities of the protonic species being observed are discussed. Proton spin counting indicates that for the samples of highest crystallinity, residual proton levels after calcination, either before or after ammonium exchange, are consistent with complete decomposition of the quaternary ammonium cation and with complete decomposition of the ammonium cation.

49582 **(IS-T—1054) Synthesis and characterization of several molybdenum chloride cluster compounds.** Beers, W.W. (Ames Lab., IA (USA)). Jun 1983. Contract W-7405-ENG-82. 145p. NTIS, PC A07/MF A01. Order Number DE83016131.

Portions are illegible in microfiche products; Thesis.

Investigation into the direct synthesis of $Mo_4Cl_8[P(C_2H_5)_3]_4$ from $Mo_2[OAc]_4$ led to a synthetic procedure that produces yields greater than 80%. The single-crystal structure disclosed a planar rectangular cluster of molybdenum atoms. Metal-metal bond distances suggest that the long edges of the rectangular cluster should be considered to be single bonds and the short metal-metal bonds to be triple bonds. This view is reinforced by an extended Hueckel calculation. Attempts to add a metal atom to $Mo_4Cl_8[PR_3]_4$ to form $Mo_5Cl_{10}[PR_3]_3$ led instead to a compound with the composition $Mo_8Cl_{16}[PR_3]_4$. Solution and reflectance uv-visible spectra and x-ray photoelectron spectra suggest that tetranuclear molybdenum units are present. The facile reaction between $Mo_8Cl_{16}[PR_3]_4$ and PR_3 imply that the linkage between tetrameric units is weak.

49583 **(IS-T—1075) Chemistry of 19-electron dinitrosyl complexes of tungsten and secondary carbene derivatives of iron.** Yu, S.Y. (Ames Lab., IA (USA)). Jun 1983. Contract W-7405-ENG-82. 235p. NTIS, PC A11/MF A01. Order Number DE83016146.

Thesis.

Nitrosyl complexes: the 18-electron dinitrosyl complexes $CpW(NO)_2(L)^+$, (Cp = eta^5 - C_5H_5), where L is $P(OPh)_3$, PPh_3, or $P(OMe)_3$, undergo a one-electron reduction when reacted with alkoxides, hydrazine, or zinc to yield the purple, air-sensitive, 19-electron, neutral complexes $CpW(NO)_2(L)$. Carbene complexes: The $Cp(CO)(L)Fe[CH(SMe)]^+$ (Cp = eta^5 - C_5H_5, L = CO, PPh_3, $P(OPh)_3$) complexes have been prepared by the reaction of $Cp(CO)(L)Fe[CH(SMe)_2]$ and CF_3SO_3H. The phosphine and phosphite derivatives are modestly stable to moisture while the dicarbonyl complex decomposes in H_2O to afford $Cp(CO)_2Fe^+$ and $Cp(CO)_2FeCH_2SMe$.

49584 **(LBL—16273) Solution chemistry of catecholate metal complexes.** Kappel, M.J. (Lawrence Berkeley Lab., CA (USA)). Jun 1983. Contract AC03-76SF00098. 166p. NTIS, PC A08/MF A01. Order Number DE83015963.

Thesis.

Chapter II is a thermodynamic study of the complexation of divalent metal ions with a di-, tri-, and tetracatecholyamide, to evaluate the specificity of the catechoylamide ligands for Fe(III) or Pu(IV). Chapter III describes the stability and protonation behavior of a series of N-substituted catechoylamide complexes of Ga(III)

and Fe(III) as determined by potentiometric and spectral titration, and infrared analysis. These ligands show lower affinity for Ga(III) or Fe(III) than unsubstituted catechoylamides and they remove Fe(III) from diferric transferrin a a slower rate. Results of the first in vitro experiments of complexation of catechoylamide ligands with plutonium are presented in Chapter IV. Electrochemical techniques have allowed the elucidation of the protonation behavior of Pu(IV)-- and Pu(III)-catechoylamide complexes. These results are compared to the protonation behavior of catechoylamide complexes of Ce(IV and Ce(III). Above pH 12 it is thought that a Pu(IV)tetrakiscatecholate complex and a Pu(III)triscatecholate complex is formed. At neutral pH, a triscatecholate-Pu(IV) complex appears to be present, indicating that the full denticity of the tetracatecholate is not utilized in vivo. The complexation of americium was studied by electrochemical and spectroscopic methods. Results indicate that catechoylamide ligands bind Am(III). The lack of evidence of the Am(IV)/(III)-catecholate electrochemical couple indicates that the potential of the free ion Am(IV)/(III) reduction couple is greater than +2.6 volts.

49585 **(LBL—16441) Actinide-specific complexing agents: their structural and solution chemistry.** Raymond, K.N.; Freeman, G.E.; Kappel, M.J. (Lawrence Berkeley Lab., CA (USA)). Jul 1983. Contract AC03-76SF00098. 51p. (CONF-8309124—2). NTIS, PC A04/MF A01. Order Number DE83016708.

From 1. international onference on the chemistry and technology of the lanthanides and actinides; Venice, Italy (5 Sep 1983).

The synthesis of a series of tetracatecholate ligands designed to be specific for Pu(IV) and other actinide(IV) ions has been achieved. Although these compounds are very effective as in vivo plutonium removal agents, potentiometric and voltammetric data indicate that at neutral pH full complexation of the Pu(IV) ion by all four catecholate groups does not occur. Spectroscopic results indicate that the tetracatecholates, 3,4,3-LICAMS and 3,4,3-LICAMC, complex Am(III). The Am(IV)/(III)-catecholate couple (where catecholate = 3,4,3-LICAMS or 3,4,3-LICAMC) is not observed, but may not be observable due to the large currents associated with ligand oxidation. However, within the potential range where ligand oxidation does not occur, these experiments indicate that the reduction potential of free Am(IV)/(III) is probably $\geqq$ + 2.6 V vs NHE or higher. Proof of the complexation of americium in the trivalent oxidation state by 3,4,3-LICAMS and 3,4,3-LICAMC elimates the possibility of tetracatholates stabilizing Am(IV) in vivo.

49586 **(PB—83-203190) Experimentelle untersuchungen zue kinetik der SO_3-spaltung bei hoeheren druecken und thermodynamische berechnung von spaltreaktoren (experimental investigations on the kinetics of the SO_3-cleavage at elevated pressures and thermodynamic calculations of cleavage reactors). Final report.** Fedders, H.; Hammeke, K.; Savvidis, E.; Dahl, R.; Hoffmann, H. (Commission of the European Communities, Luxembourg). [nd]. 175p. (EUR—7596-DE). NTIS, PC E08/MF E08.

Experimental investigations on the kinetics of the SO_3-cleavage are described in the report. The experiments were carried out in a tubular flow reactor used as a differential reactor. The results of the measurements are presented in three ways, viz, by the Exponential Method, the Hinshelwood Theorem, and by Pore Model calculations. Based on the results of the kinetic investigations and using heat transfer relations reported elsewhere (EVA I), detailed calculations for the design of fullscale SO_3-cleavage reactors were made. Experiences on the corrosion of the materials of construction employed are described.

49587 **Isopiestic determination of the osmotic and activity coefficients of aqueous mixtures of NaCl and $SrCl_2$ at 25°C.** Rard, J.A.; Miller, D.G. (University of California, Lawrence Livermore National Laboratory, Livermore, California 94550). *Theoretical Chemical Engineering Abstracts;* **27**: No. 3, 342-346(Jul 1982). Contract W-7405-ENG-48.

The osmotic and activity coefficients of aqueous mixtures of NaCl and $SrCl_2$ have been determined at 25°C by the isopiestic method. These measurements extend from moderate concentrations to the crystallization limits of the mixtures; results are in excellent agreement (0.1-0.2%) with published isoplestic data in overlapping regions of concentration. Osmotic and activity coefficients for NaCl-$SrCl_2$ mixtures are reliably represented by both Pitzer's equations and Scatchard's neutral electrolyte equations.

4003 Organic Chemistry

REFER ALSO TO CITATION(S) 48527, 48607, 48614, 48615, 48616, 48774, 48888, 49574, 49575, 49933

49588 **(AD-A—126960/4) Progress report: oxidation stability studies of deuterated esters. Memorandum report.** Pande, S.G.; Ravner, H. (Geo-Centers, Inc., Newton Upper Falls, MA (USA); Naval Research Lab., Washington, DC (USA)). 26 Apr 1983. 57p. NTIS, PC A04/MF A01.

The significantly higher oxidation stability of partially deuterated neopentyl polyol esters examined in this work appears to be the resultant product of two effects, viz., deuteration and the synergistic effect of alkali metal compounds with the antioxidant. The enhancement in oxidation stability attributable to deuteration (97%) of the acid moiety of the ester appears to be 3 to 4-fold at 220 C. A similar degree of enhancement was obtained at Naval Air Development Center on 97% deuteration of a synthetic hydrocarbon. An additional enhanced lifetime of approx. 30-fold in the neopentyl polyol esters (deuterated and non-deuterated) appears to be due to an alkali metal effect.

49589 **(CONF-8305100—3) Influence of redox and Lewis-acid functions of $SbCl_3$-rich molten-salt catalysts on the reactions of coal-model compounds.** Buchanan, A.C. III; Dworkin, A.S.; Smith, G.P. (Oak Ridge National Lab., TN (USA)). 1983. Contract W-7405-ENG-26. 27p. NTIS, PC A03/MF A01. Order Number DE83014045.

From 4. Electrochemical Society international symposium on molten salts; San Francisco, CA, USA (8 May 1983).

Recent studies of the chemistry of coal-model compounds in $SbCl_3$-based molten salt catalysts have shown that both the redox and Lewis acid functions of these media can play principal roles in catalyzing reactions for organic substrates. These two catalytic functions are discussed in relation to two reaction types that have been recently discovered in highly purified, anhydrous $SbCl_3$-rich melts. The redox function of the melt is shown to play the dominant catalytic role in a transfer hydrogenation reaction for oxidizable arenes that are selectively hydrogenated by tetralin at only 80°C. The arene radical cation is found to serve as the key organic reactive intermediate. The Lewis-acid function of the melt is shown to catalyze selective transalkylation chemistry for the α,ω-diphenylalkanes, $C_6H_5(CH_2)nC_6H_5$ [n = 1-4] with the catalyst generating a benzylic carbenium ion as the key reactive intermediate. 9 figures, 1 table.

49590 **(DOE/ER/06030—4) Kinetic study of radical-aromatic hydrocarbon reactions. Progress report covering August 1, 1982-April 15, 1983.** (Georgia Inst. of Tech., Atlanta (USA)). 1983. Contract AS05-78ER06030. 9p. NTIS, PC A02/MF A01. Order Number DE83016062.

During this period, measurements of the rate coefficients for $H(^2S)$ atom reactions with C_6H_6 and C_6D_6 were completed. The reactions of $D(^2S)$ with C_6H_6 and C_6D_6 were also studied. The reactions of $H(^2S)/D(^2S)$ with toluenes and xylenes are still under progress; rate coefficient measurements are complete. (DLC)

49591 **(INIS-mf—7908) Temperature measurement in the chemical industry.** Stoor, P.G.J. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 9p. (CONF-8010325—15). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780764.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 3. Paper no. 2.

Methods of temperature measurement used in the chemical plant of ICI are outlined. The two main applications are in temperature control and in temperature monitoring. (U.K.).

49592 **(UCRL—88800) Theoretical and experimental studies of shock-compressed benzene and polybutene.** Ree, F.H.; Nellis, W.J.; Trainor, R.J.; Mitchell, A.C.; Boslough, M. (Lawrence Livermore National Lab., CA (USA)). 13 Jul 1983. Contract W-7405-ENG-48. 5p. (CONF-830719—23). NTIS, PC A02/MF A01. Order Number DE83015884.

From American Physical Society meeting on shock waves in condensed media; Santa Fe, NM, USA (18 Jul 1983).

Experimental and theoretical studies are reported on shock pressure, volume, and temperature of liquid polybutene and benzene over the pressure ranges 19 to 210 GPa and 39 to 70 GPa, respectively. Analysis of the (P-V) Hugoniot data is consistent with a model which assumes hydrocarbons to be decomposed into a dense diamond-like phase and hydrogen in the molecular phase. Observed deviations between the experimental and the theoretical temperature data may be due to large heat capacities associated with few heavy hydrocarbon species which are neglected in the above hydrocarbon model.

4004 Electrochemistry

REFER ALSO TO CITATION(S) 48888, 49224, 49574

49593 **(CONF-8305100—5) Electrochemical behavior of sulfide ions in molten cryolite.** Minh, N.Q.; Yao, N.P. (Argonne National Lab., IL (USA)). 1983. Contract W-31-109-ENG-38. 9p. NTIS, PC A02/MF A01. Order Number DE83014299.

From 4. Electrochemical Society international symposium on molten salts; San Francisco, CA, USA (8 May 1983).

The electrochemical behavior of sulfide ions in molten cryolite (Na_3AlF_6) has been studied by cyclic voltammetry using graphite electrodes at 1323 K. The oxidation of sulfide ions is found to proceed via a quasi-reversible mechanism, i.e., one in which the current is controlled by both diffusion and charge-transfer kinetics, S^{2-} reversible S + $2e^-$. The transfer coefficient β and the standard rate constant k/sub s/ are estimated to be 0.5 and 0.0042 cm/s, respectively. The apparent diffusion coefficient for sulfide ions in cryolite at 1323 K is about 3.93×10^{-5} cm^2/s.

49594 **The influence of gas composition on the oxygen electrode reaction in the molten Li_2CO_3-Na_2CO_3-K_2CO_3 eutectic mixture.** White, S.H.; Twardock, U.M. (EIC Laboratories, Inc. 111 Chapel Street, Newton, MA 02158). *Electrochimica Acta;* 27: No. 11, 1599-1608(Nov 1982). Contract AC05-79ET15403.

Several different electrochemical techniques have been used to study the redox reactions at smooth gold electrodes in molten ternary alkali metal carbonate eutectic mixture equilibrated with different atmospheric compositions of carbon dioxide and oxygen. The diffusion controlled redox reaction was identified by chronopotentiometry, which, together with cyclic voltammetry and normal pulse voltammetry, confirmed that both peroxide and oxide ions were present simultaneously. The ratio of peroxide to oxide ions depended on the gas composition. A simple thermodynamic model enabled concentrations of these species to be predicted and correlated with the experimental measurements. The diffusion coefficients of peroxide and oxide ions were deduced from these data.

4005 Photochemistry

REFER ALSO TO CITATION(S) 48817

49595 **(LBL—15354) Molecular-beam studies of photodissociation reactions.** Krajnovich, D.J. (Lawrence Berkeley Lab., CA (USA)). May 1983. Contract AC03-76SF00098. 367p. NTIS, PC A16/MF A01. Order Number DE83015962.

Portions are illegible in microfiche products; Thesis.

A variety of photodissociation reactions have been investigated using the method of crossed laser and molecular beams. The vibrational predissociation reactions of $(C_2H_4)_2$ and $(NH_3)_2$ at 10.6μ are discussed. Results of infrared multiphoton dissociation studies of C_2F_5Cl and C_2F_5Br are qualitatively consistent with RRKM theory and the rate equation model for infrared multiphoton absorption and dissociation. Studies of bromine dimer photodissociation at 484 nm and 532 nm are reported. A reliable lower bound of 5.2 kcal/mole is obtained for the binding energy of Br_3. The study of CF_2Br_2 photodissociation indicates that: Br atom elimination is the only important primary dissociation channel at 248 nm; the electronic transition leading to formation of CF_2Br + Br is polarized parallel to the Br-Br axis in CF_2Br_2; some of the CF_2Br primary products undergo efficient secondary photodissociation. Results of a study of the ultraviolet photodissociation of C_2F_5Br,C_2F_5I, and 1,2-C_2F_4BrI are presented. Center-of-mass recoil energy and angular distributions were determined for each of these reactions and used to test simple predictions based on molecular orbital theory.

49596 **(PB—83-200584) Study of primary and associated reactions in photosynthesis.** Duysens, L.N.M.; van Grondelle, R.; Pulles, M.P.J. (Commission of the European Communities, Luxembourg). [nd]. 156p. (EUR—7793-EN). NTIS, PC E08/MF E08.

As part of a photosynthetic research project to determine whether plants could be used as economical energy converters, a study was made of: the emission yield of bacteriochlorophyll at low redox potentials, the energy transfer in pigment systems, and the electron transport at the donor side of photosystem 2 using chlorophyll-a fluorescence as a monitor of the reduction of the photo-oxidised primary donor P680(+).

4006 Radiation Chemistry

REFER ALSO TO CITATION(S) 48691, 49525, 49916

49597 (IA—1375, pp 172) **Nylon-6 water-permeable membranes prepared by electron beam radiation induced graft-copolymerization. Pt. III. Nylon crystallinity conservation in highly grafted nylon membranes.** Haruvy, Y.; Rajbenbach, L.A. (Israel Atomic Energy Commission, Tel Aviv); Jagur-Grodzinsky, J. (Weizmann Inst. of Science, Rehovoth (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49598 (IA—1375, pp 171-172) **Flame retardancy of polyester by radiolytically grafted polystyrene.** Mey-Marom, A.; Behar, D.; Rajbenbach, L.A. (Israel Atomic Energy Commission, Tel Aviv); Levy, M. (Weizmann Inst. of Science, Rehovoth (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49599 (IA—1375, pp 135) **Heterogeneization of the water soluble noble metal polymer catalyst system.** Baruch, G.; Haruvy, Y.; Rajbenbach, L.A.; Rafaeloff, R. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49600 (IA—1375, pp 169) **Pulse radiolysis studies of AZA analogues of nucleic acid components.** Faraggi, M.; Rosenthal, I. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49601 **(ORO—3106-82) Radiation chemistry of hydrocarbon and alkyl halide systems. Progress report, August 1, 1982-July 31, 1983.** Hanrahan, R.J. (Florida Univ., Gainesville (USA). Dept. of Chemistry). 1983. Contract AS05-76ER03106. 35p. NTIS, PC A03/MF A01. Order Number DE83016175.

Experimental work was in progress during the past year on three systems: investigation of gas phase OH radical reactions using the pulse radiolysis method; studies of the radiolytic oxidation of propane; and an investigation of photochemistry and mass spectrometry of CF_3I-CH_3I mixtures. In addition, data analysis and interpretation of previously obtained results on H_2/CO systems was under way. Progress made in these areas is described.

4007 Radiochemistry And Nuclear Chemistry

REFER ALSO TO CITATION(S) 48697, 48698, 49575, 50260

49602 **(CONF-820973—3) Foam process for application of decontamination agents.** Harris, J.M.; Miller, J.R.; Frazier, R.S.; Walter, J.H. (Rockwell International Corp., Canoga Park, CA (USA). Energy Systems Group). 1982. Contract AM03-76SF00701. 14p. NTIS, PC A02/MF A01. Order Number DE83016076.

From International conference on decontamination of nuclear facilities; Niagara Falls, Canada (19 Sep 1982).

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This paper presents the results and observations of a study performed by the authors to parametrically evaluate the performance characteristics of a foam process for application of decontamination agents. The initial tests were established to assess foam quality. Subsequent tests determined the ability of the foam as a carrier of chemical systems, and established system operating parameters. The technique was then applied in an actual decontamination task to verify effectiveness of these established parameters and to determine decontamination reduction factors. 4 figures, 5 tables.

49603 (IA—1375, pp 186) **Biosynthetic preparation of high specific activity $H^{35}S$-labelled methionine.** Freud, A.; Hirshfeld, N.; Heimer, Y.; Teitelbaum, Z. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49604 (IA—1375, pp 188-189) **Improved method for preparation of radioiodinated 2'-deoxyuridine.** Freud, A.; Solenchek, D.; Ben-Hur, E.; Teitelbaum, Z. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49605 (IA—1375, pp 189) **Cationic complexes of 99m-Tc for myocardial imaging.** Lavie, E.; Sadeh, T. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49606 (IA—1375, pp 190-191) **Preparation and labelling of platelets with 111-In-oxine.** Lavie, E. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49607 (IA—1375, pp 191-192) **Radioiodination of testosterone for radioimmunoassay.** Canfi, A.; Teitelbaum, Z. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49608 (IA—1375, pp 179-180) **Epithermal neutron self-shielding in the reactor production of Mo-99.** Abrashkin, S. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49609 (IA—1375, pp 180-181) **Preparation of tritiated azido derivatives.** Buchman, O.; Shimoni, M.; Hagag, Y.; Cohen, A.; Azran, J. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49610 (IA—1375, pp 181-182) **Tritiation of iprindole at high specific activity.** Buchman, O.; Shimoni, M.; Cohen, A.; Hagag, Y.; Azran, J. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49611 (IA—1375, pp 182) **Tritiation of trimeprazine.** Shimoni, M.; Azran, J.; Cohen, A.; Hagag, Y.; Buchman, O. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49612 (IA—1375, pp 182-183) **Selective labelling of chlorpheniramine.** Buchman, O.; Shimoni, M.; Azran, J.; Cohen, A.; Hagag, Y. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49613 (IA—1375, pp 184) **Labelled synthesis of 0,0-diethyl 0-p-nitrophenylphosphate-(3-(5)-^{3}H).** Shimoni, M.; Azran, J.; Cohen, A.; Hagag, Y.; Buchman, O. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49614 (IA—1375, pp 184-185) **Structurally sensitive antidepressants labelled with tritium.** Buchman, O.; Shimoni, M.; Azran, J.; Cohen, A.; Hagag, Y. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49615 (IA—1375, pp 144) **Influence of CaF_2 on the solubility of uranium.** Feldstein, H.; Bircz, R.; Fischer, R. (Israel Atomic Energy Commission, Tel Aviv); Bear, M. (Israel Ceramic and Silicate Inst., Haifa (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49616 (IA—1375, pp 186-188) **Syntheses of selenium- and tellurium-bearing hetero-cyclic amino acids.** Sadeh, T. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49617 **(LA—9797-PR) Isotope and Nuclear Chemistry Division annual report FY 1982, October 1981-September 1982.** Lindberg, H.A. (ed.). (Los Alamos National Lab., NM (USA)). Jun 1983. Contract W-7405-ENG-36. 272p. NTIS, PC A12/MF A01. Order Number DE83016355.

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This report describes progress in the major research and development programs carried out in FY 1982 by the Chemistry-Nuclear Chemistry Division, which became the Isotope and Nuclear Chemistry Division in August 1982. It will cover radiochemical diagnostics of weapons tests; weapons radiochemical diagnostics research and development; other unclassified weapons research; stable and radioactive isotope production, separation, and applications (including biomedical applications); element and isotope transport and fixation; actinide and transition metal chemistry; structural chemistry, spectroscopy, and applications; nuclear structure and reactions; irradiation facilities; the development and applications of advanced analytical techniques; atmospheric chemistry and transport; earth and planetary processes; and special activities.

42 ENGINEERING

4201 General Engineering

REFER ALSO TO CITATION(S) 49253, 49815

49618 **(SAND—83-1474C) Particle-velocity measurements of laser-induced shock waves using ORVIS.** Sheffield, S.A.; Fisk, G.A. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 7p. (CONF-830874—15). NTIS, PC A02/MF A01. Order Number DE83016503.

From 27. annual international technical symposium on high speed photography, videography and photonics; San Diego, CA, USA (21 Aug 1983).

This paper discusses experiments in which 2 to 200-μm-thick aluminum foils were irradiated with Nd/YAG laser pulses at 3 to 4 GW/cm^2 for 10 ns. An optically recording velocity interferometer system (ORVIS) was used to record the resulting particle-velocity histories with nanosecond resolution. Results show that foils suspended in air are accelerated, over a period about three times the length of the laser pulse, to a final velocity inversely proportional

to foil thickness. A 12-μm-thick foil attains a peak velocity of 0.2 km/s. Foils confined by water undergo most of their acceleration during the laser pulse and attain surface velocities three times greater than do air-suspended foils of the same thickness.

49619 **(UCID—19863) NESD CAE facility minimal implementation plan (June 1982).** Ames, H.S. (Lawrence Livermore National Lab., CA (USA)). 4 Aug 1983. Contract W-7405-ENG-48. 11p. NTIS, PC A02/MF A01. Order Number DE83016939.

In conjunction with other divisions in the EE Department, the Nuclear Energy Systems Division is developing a Computer-Aided Engineering (CAE) capability. Some of our needs in areas such as drafting, PC design, and IC design can be satisfied with existing turnkey systems. Many of our other needs, including modeling, analysis, document management and communication, software development, project management, and project communication will require the gradual development of an expanded computing environment. The purpose of this document is to describe our initial plans to implement a CAE facility.

4202 Facilities And Equipment

REFER ALSO TO CITATION(S) 48593, 48600, 48645, 49321, 49602, 49719, 50391, 50394, 50416

49620 **(CONF-8209159—1) Measuring and drilling tools for directional drilling - state of the art.** Eickelberg, D.; Rischmueller, W.; Burger, E.; Juergens, R. (Christensen Diamond Products G.m.b.H., Celle (Germany, F.R.)). 1982. 125p. (In German). NTIS (US Sales Only), PC A06/MF A01. Order Number DE83770326.

From 9. international symposium '82 of Baker Oil Tools G.m.b.H.; Celle, F.R. Germany (3 Sep 1982).

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The state of the art of directional drilling is described for the fields of measuring tools, MWD tools, deflecting tools, direct drives for drill bits, stabilizers and antimagnetic drill collars.

49621 (IA—1375, pp 113-114) **Development of special devices for CO_2 laser welding and investigation of the welding parameters.** Ram, V.; Naim, M.; Galili, M.; Eden, S.; Kohn, G.; Stern, A. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49622 (IA—1375, pp 112-113) **Development of ultrasonic nondestructive testing of spot welds.** Bendec, F.; Peretz, M. (Israel Atomic Energy Commission, Tel Aviv); Rokhlin, S.I. (Ben-Gurion Univ. of the Negev, Beersheba (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49623 **(INIS-BR—09) Criticality safety of pipe systems which contain solutions of fissile materials.** dos Santos, R. (Instituto Militar de Engenharia, Rio de Janeiro (Brazil)). Mar 1982. 236p. (In Portuguese). NTIS (US Sales Only), PC A11/MF A01. Order Number DE83702796.

Thesis.

Criticality calculations for geometric configurations here studied make use of the neutron transport equation in its multigroup formulation, which is solved by the Monte Carlos statistical-probabilistic method. The computational code KENO IV, which use the Monte Carlo method, was utilized in all criticality calculations. All calculations were restricted to plutonium nitrate solutions, 100w% concentration of Pu-239, in water. Calculations were performed to obtain critical dimensions (radius) of a bare infinite cylinder and the effect produced by the addition of a 0.32 cm stainless steel cladding analyzed. Then, The most simple pipe intersection system is examined: the addition, of another cylinder to the one studied in the preceding case, constituting the type 'T' intersection. Further addition of a second cylinder, to the T-Type system is investigated; this is the cross-intersection type. Next, the effect produced by the introduction of a second central column to type 'T' system is analyzed. The effect of the introduction of several arms in the same quadrant is also studied. Infinite cylinders and cross-intersection type systems are analyzed in their nominal and maximum reflection conditions.

49624 **(INIS-mf—8026) Instruction of 6 August 1974: Conditions for acceptance of radioactive materials exempted from special transport requirements.** 1974. 5p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780789.

Published in the Bulletin Officiel des P.T.T. (Post Office).

The purpose of this Instruction is to define the conditions for sending radioactive materials exempt from special transport requirements through the postal service. (NEA).

49625 **(INIS-mf—8038) Ministerial Order of 22 August 1957 on the transport of dangerous materials by air.** 17 Sep 1957. 3p. (In French). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83780790.

Published in the French Official Gazette.

This Order provides for the conditions of transport of dangerous materials by air. Materials regarded as dangerous to handle or transport by aircraft from a safety or health standpoint may possibly not be accepted, or only accepted under certain conditions. These materials include radioactive materials in Class IV(b). (NEA).

49626 **(INIS-mf—8039) Order of 28 April 1980 on the transport and handling of dangerous materials (amendment of Class IVb) [radioactive materials] of the Regulations of 15 April 1945 on the transport of dangerous materials (dangerous materials 1980 No 1).** 8 Jul 1982. 2p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780791.

Published in the French Official Gazette.

The amendments made by this Order to the 1945 Regulations concern, in particular, the characteristics of the materials and their packaging conditions. (NEA).

49627 **(INT—164/E) Wandering probe for tightness testing of the gas pipelines by means of the radiotracer method.** Korbel, K.; Lacki, E. (Institute of Physics and Nuclear Techniques, Krakow (Poland)). 1981. 15p. (In Polish). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702325.

The report deals with the problem of the application of radiotracer techniques in the examination of the gas pipelines tightness. In particular, it gives a concise description of the construction of a special "wandering probe" for the localization of radiotracer leaks extorted in course of the measurements.

49628 **(IS-T—1070) Pair-breaking mechanisms in superconductor-normal metal-superconductor (SNS) junctions.** Yang, H.C. (Ames Lab., IA (USA)). Jun 1983. Contract W-7405-ENG-82. 88p. NTIS, PC A05/MF A01. Order Number DE83016414.

Thesis.

Critical current density, J/sub c/, has been measured for high-quality Pb-Ag/sub 1-x-y/Mn/sub x/Al/sub y/-Pb junctions over a wide range of temperature and composition. The temperature dependence of J/sub c/ for samples containing magnetic impurities are found to follow a theory developed by Makeev et al. for a bridge geometry. This then implies that for the sandwich geometry, the modulus of the order parameter at the boundary is proportional to its bulk value in the superconductor as was assumed by Makeev et al. In this range, xi/sub s/ is essentially independent of T, so this is a reasonable result. As T approaches T/sub c/, J/sub c/ was found to be proportional to $(I-T/T/sub\ c/)^2$ as predicted. One junction which had a Mn concentration of about 0.5% and a spin glass temperature of 2.9K showed an inflection point in the J/sub c/1/2 vs. T data near 2.7K If data are taken in the presence of a constant magnetic field, then quantum oscillations are observed.

49629 (JAERI—1276) Efficient computer program EPAS-J1 for calculating stress intensity factors of three-dimensional surface cracks. Miyazaki, N.; Watanabe, T.; Yagawa, G. (Japan Atomic Energy Research Inst., Tokyo). Mar 1982. 61p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702424.

A finite element computer program EPAS-J1 was developed to calculate the stress intensity factors of three-dimensional cracks. In the program, the stress intensity factor is determined by the virtual crack extension method together with the distorted elements allocated along the crack front. This program also includes the connection elements based on the Lagrange multiplier concept to connect such different kinds of elements as the solid and shell elements, or the shell and beam elements. For the structure including three-dimensional surface cracks, the solid elements are employed only at the neighborhood of a surface crack, while the remainder of the structure is modeled by the shell or beam elements due to the reason that the crack singularity is very local. Computer storage and computational time can be highly reduced with the application of the above modeling technique for the calculation of the stress intensity factors of the three-dimensional surface cracks, because the three-dimensional solid elements are required only around the crack front. Several numerical analyses were performed by the EPAS-J1 program.

49630 (JAERI-M—9957) Preliminary analysis on shielding experiment of a spent fuel transport cask. Katakura, J.; Komuro, Y.; Yamano, N.; Naito, Y. (Japan Atomic Energy Research Inst., Tokyo). Mar 1982. 98p. (In Japanese). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702421.

Shielding experiment of a spent fuel transport cask has been planed at JAERI to confirm the reliability of a shielding safety evaluation code system. As a preliminary analysis of the experiment, radiation source intensity, neutron and gamma-ray transport and neutron reactivity calculations were performed. To evaluate the calculation method, effects of several parameters were also surveyed. From the above study, the analysis method which should be used at actual analysis was prepared, and dose rate distribution of radio-activity around the cask was estimated.

49631 (KFK-PFT—45) Orientation and feeding of difficult to handle workpieces. Noelke, W.; Hilgenboecker, H. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Projekttraegerschaft Fertigungstechnik). Feb 1983. 417p. (In German). NTIS (US Sales Only), PC A18/MF A01. Order Number DE83751104.

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Flat workpieces are intermediate products of punching machining. The orientation of the workpieces is lost between the machining processes. Of course there are well known devices for sections of partial mechanizing for some of the handling function, but they are generally tuned to determined machines and workpieces and their moving program often is coupled strong on to the operating cycle. Sometimes flexible handling devices will be used, too. But all these solutions are presuming for the workpieces sufficient material thickness and resistance to deflection as well as untroubled interactive behaviour. If only one of these conditions is not performed the mechanical device will fail. The objectives of this report are to pose the problem by scientific methods and the development of parts of handling devices. There are given some ways to advance which allow systematically studies as a basic for an universal way to come to an approach. Researches in several production regions have shown a lot of different problems. It is written how they will be avoided by development of alternative handling strategies. Also there are described some new devices which are making possible as well as to improve mechanized handling of flat workpieces by using the special behaviour of such parts. Also there are given hints for handling, like designing not only the workpieces but also the tools and the production organization. There is given a reference to the investigations of a project partner, too.

49632 (NUREG/CR—3284) Review of current analysis methodology for reinforced concrete structural evaluations. Sharma, S.; Reich, M.; Chang, T.Y. (Brookhaven National Lab., Upton, NY (USA)). Apr 1983. Contract AC02-76CH00016. 136p. (BNL-NUREG—51673). NTIS, PC A07/MF A01 - GPO. Order Number DE83016858.

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This report presents an in-depth review of current modeling techniques and nonlinear analysis procedures for reinforced concrete structural evaluations. A detailed discussion is given of numerous mathematical models that have been proposed in the literature for modeling the nonlinear material behavior of concrete and steel and for representing the complex concrete-steel interaction effects. Finite element discretizations of reinforced concrete structures based on discrete, embedded and smeared approaches are described. Special modeling techniques for representing such effects as cracking, crushing, tension stiffening, shear transfer, concrete-steel bond degradation and loss of prestress are discussed in detail. Further, various static and dynamic nonlinear solution procedures are reviewed in terms of solution accuracy and computational efficiency. Numerical examples are presented to demonstrate the extent of variations in analytical predictions that can result when different modeling approaches are used.

49633 (SAND—83-1123) Optical analysis of a gimballed mirror system. Phipps, G.S. (Sandia National Labs., Albuquerque, NM (USA)). Jul 1983. Contract AC04-76DP00789. 38p. NTIS, PC A03/MF A01. Order Number DE83016765.

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The pointing nonorthogonality and image rotation caused by reflection from a flat mirror that is gimballed in spherical coordinates is analyzed to permit more accurate error decoupling, photometric image derotation, and trajectory calculation for the Laser Tracker II system.

49634 (SAND—83-1325) Simple ideal gas model of the Pavlovskii high-explosive opening switch. Tucker, T.J. (Sandia National Labs., Albuquerque, NM (USA)). Aug 1983. Contract AC04-76DP00789. 24p. NTIS, PC A02/MF A01. Order Number DE83016630.

The behavior of the Pavlovskii type high-explosive opening switch is modeled using an ideal gas formulation. It is shown that this simple 1-D model agrees with experiment during early arc compression but that at later times the process exhibits a more complex behavior, possibly resulting from turbulent mixing.

49635 (UCRL—89649) Techniques for precision air-temperature control. Hansen, H.J. (Lawrence Livermore National Lab., CA (USA)). 25 Jul 1983. Contract W-7405-ENG-48. 9p. (CONF-830874—14). NTIS, PC A02/MF A01. Order Number DE83016192.

From 27. annual international technical symposium on high speed photography, videography and photonics; San Diego, CA, USA (21 Aug 1983).

High-quality air-temperature control can provide an excellent means for minimizing the thermal drift of machine tools and inspection instruments when other means are not practical. Improvements in air-temperature control has been improved in several machining areas by as much as ten to one by the careful identification of heat loads and the application of some fundamental classical control theory.

4203 Lasers

REFER ALSO TO CITATION(S) 48629, 50414

49636 (AD-A—126776/4) Chemical generator and epr studies of the chemical-oxygen-iodine-laser system. Technical report. Cummings, M.E.; Davis, L.P.; Dymek, C.J. Jr; Fox, J.W.; Stoner, D.W. (Air Force Academy, CO (USA). Frank J. Seiler Research Lab.). Mar 1983. 33p. (FJSRL-TR—83-0003). NTIS, PC A03/MF A01.

Formation of 02(1 delta) by reaction of Cl2 gas with basic H202 liquid was studied using a small scale batch reactor. Effect on 02(1 delta) yield of certain reaction/reactor parameters were evaluated. Parameters included molarity of base and presence of Cl(-) in initial reaction solution, use of Br2 as reactant, depth of Cl2 injector in solution, area of colled trap surface, and use of halocarbon coating on flow tube walls. Use of Cl2, base molarity, and trap condition were areas in which greatest effects were observed. Mixtures of argon and I2 were added to the flowing output from the generator and the high-field (1.7-2.4 T) EPR spectrum was scanned. No I2 or I species were observed. Values of g exp for two previously unreported EPR lines in the J=3 level of 02(1 delta) were obtained.

4204 Heat Transfer And Fluid Flow

49637 **(FRNC-TH—1098) Resolution of Navier-Stokes equations by a finite element method.** Ibler, B. (Paris-11 Univ., 91 - Orsay (France)). Jan 1981. 84p. (In French). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702794.

Thesis.

This equation governs the flow of an incompressible viscous fluid and particular interest is taken in Reynolds' large numbers. It should be possible to find this solution in an industrial context. The applications are many, for instance the internal flows of reactors. To this end, a velocity-pressure formulation in the equations was chosen. A method of solution based on the separate processing of the convective terms was proposed. This process makes it possible to take the hyperbolical character of the convection into account and consequently to obtain results for high Reynolds numbers. The convection equation delta f/delta t + u vector . grad f = g is solved by a characteristics method. First, the method is explained on a linear case where the function f is independent of the given u field. The model is then applied to cases of Navier-Stokes equations. The Stokes problem is then studied. The construction of elements with a nil divergence being difficult to carry out, a weak formulation of this constraints was taken first. But the dimension of the linear systems to be solved is too great, so finally a method due to Glowinski was used. This method breaks down the problem into a series of Dirichlet problems with only one unknown quantity. The linear systems are solved by a method of preconditioned conjugate gradient which enables problems with a great number of points to be dealt with. To conclude, the digital numbers obtained are presented and a generalization of the method studied with bidimensional Saint-Venant equations is given in an appendix.

49638 **(LBL—16297) Influence of combustion on Reynolds stress in a strongly heated turbulent boundary layer.** Cheng, R.K.; Ng, T.T. (Lawrence Berkeley Lab., CA (USA); Notre Dame Univ., IN (USA). Dept. of Aeronautical and Mechanical Engineering). Jun 1983. Contract AC03-76SF00098. 28p. (CONF-830702—22). NTIS, PC A03/MF A01. Order Number DE83015524.

From 21. ASME/AIChE national heat transfer conference; Seattle, WA, USA (24 Jul 1983).

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Conditional Reynolds stress statistics in a reacting turbulent boundary layer over a strongly heated wall were obtained using two color laser Doppler anemometry technique. Quadrant analysis of the data showed that the reduction in Reynolds stress due to combustion was caused by a decrease in contribution from the bursting event.

49639 **(NP—3770323) Contribution to axial heat conduction in packed pebble beds.** Adam, W. (Technische Univ. Muenchen (Germany, F.R.). Lehrstuhl A fuer Thermodynamik). 5 Jul 1982. 163p. (In German). NTIS (US Sales Only), PC A08/MF A01. Order Number DE83770323.

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Earlier studies by Dietrich and Simon already pointed out that of the empirical relation for the effective axial heat conductivity published already in 1960 by Yagi, Kunii, Wakao, results in too large values for lambdasub(ax)sup(eff) within the scope of investigations on reaction kinetics, if measured ignition and extinction points of an exothermal reaction occurring in a packed bed is compared with calculations using the values for lambdasub(ax)sup(eff) according to the above equation. This problem is dealt with in the first part of the thesis. In particular, an essential influence of the nonuniform flow distribution in a pebble bed through which a flow is passing is found. In the second part the axial heat conductivity of a pebble bed is changed by heat conducting internals, and the effects of these measures on the reactions behavior of a packed bed reactor is investigated experimentally. An increase of the axid heat conductivity in a system reacting exothermally will enlarge the igniting/extincting hysteresis, which for operation of the reactor may lead to energy savings if after ignition of the reactor the preheat temperature is decreased to a value just before reaching the extinction temperature. The effects to be obtained are determined experimentally. Experiments concerning the influence of radially conducting internals on the behavior of wall-cooled reactors are presented, too.

49640 **High-temperature heat pipes for waste-heat recovery.** Merrigan, M.A.; Keddy, E.S. (Los Alamos National Laboratory, Los Alamos, NM). *Terotechnology News;* **6**: No. 5, 298-303(Sep 1982).

Heat pipes capable of operating in air and combustion product environments at high temperatures have been investigated with the objective of developing the technology necessary to their application in industrial waste-heat recuperation. Operation of heat pipes in air at temperatures above 1200 K has been accomplished using SIC as a shell material and a chemical vapor deposit (CVD) tungsten inner liner for protection of the ceramic from the sodium working fluid. The CVD tungsten has been used as a distribution wick for gravity-assisted heat pipes through the development of a columnar tungsten surface structure, achieved by control of the metal vapor deposition rate. Wick performance has been demonstrated in tests at approximately 2-kW throughput with a 19mm-i.d. SiC heat pipe. Operation of ceramic heat pipes in repeated start cycle tests has demonstrated their ability to withstand temperature rise rates of greater than 1.2 K/s.

49641 **Pressure fluctuations and flow pattern recognition in vertical two phase gas-liquid flows.** Tutu, N.K. (Department of Nuclear Energy, Brookhaven National Laboratory, Upton, NY 11973). *International Journal of Multiphase Flow;* **8**: No. 4, 443-447(Aug 1982). Contract AC02-76CH00016.

Presented are measurements of wall pressure fluctuations and pressure drop fluctuations for the flow regimes of bubbly, slug, churn, and annular type. Schematic of the air water loop that was used for the measurements is shown. Two phase gas-liquid flows play an important role in advanced energy conversion systems, large industrial chemical reactors, and diverse systems such as oil gas pipelines and nuclear reactors. Flow pattern maps based on visual observations have been developed by various investigations and form the basis for predicting flow regimes. The probability density function (PDF) of the pressure drop signal can be used objectively to discriminate between the various flow regimes in vertical two phase gas-liquid flows when the average pressure drop is mostly gravitational. This technique of flow pattern recognition, unlike the x-ray technique, is simple and applicable to large sized ducts without increase in cost or complexity.

49642 **(RFP-Abst—08) Magnetic fluid.** Shimoiizaka, J. Translated from *Nippon Kinzoku Gakkai Kaiho ;* **15**: No. 2, 77-82(1976). Contract AC04-76DP03533. 4p. NTIS, PC A02/MF A01. Order Number DE83014110.

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This review covers: magnetism and viscosity of magnetic fluids; applications of magnetic fluids as sealing fluid, magnetic flotation, oil-water separation, and energy conversion. (GHT)

4205 Materials Testing

REFER ALSO TO CITATION(S) 49815

49643 **(DOE/ET/29154—1) Detection and location of incipient faults on power cables. Final report.** (Purdue Univ., Lafayette, IN (USA)). Feb 1981. 120p. NTIS, PC A06/MF A01. Order Number DE83016420.

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This report reviews the basic concepts, applications, operating strageties and specific instrumentation for the detection and location of incipient faults in power cables by the processing of the electromagnetic noise at the power cable terminals. It also presents the details and test results of two instruments which were developed for the purpose. Tests on a length of 15 kV class distribution cable with staged incipient faults are described which show that the instrumentation is capable of detecting and locating partial discharge noise sources on the cable with interesting precision.

49644 **Measurement of residual stress in metals using a position-sensitive detector.** Coyle, R.A.; Tate, G.R. (Aeronautical Research Labs., Melbourne (Australia). Materials Div.). pp 416-419 of Physics for Australia's development. 2nd applied physics conference of the Australian Institute of Physics. Sydney, Australia; Australian Institute of Physics (1981). (CONF-811279—).

From 2. applied physics conference of the Australian Institute of Physics; Melbourne, Australia (1 Dec 1981).

Residual macro-stress can be measured in metals by X-ray diffraction techniques. To obtain information from specimens with varying residual stresses it is necessary to take many individual stress readings. Data collection using film or diffractometry is thus impractical. Position-sensitive detectors enable rapid collection of diffraction lines over an angular range of about five degrees. A PSD has been mounted on an x-ray film unit previously used for measuring stress in large components. The system is capable of making individual stress readings in about two minutes.

4206 Safety Engineering

49645 **(CONF-8210165—) Problems of automatic fire detection.** (Gesamthochschule Duisburg (Germany, F.R.). Fachgebiet Nachrichtentechnik, Grundgebiete und Bauelemente der Nachrichtentechnik). Oct 1982. 579p. (In German). NTIS (US Sales Only), PC A25/MF A01. Order Number DE83770322.

From 8. international meeting on problems of automatic fire detection; Duisburg, F.R. Germany (5 Oct 1982).

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Developments in modern electronics and more sophisticated aerosol (smoke) monitoring techniques have brought major innovations to fire detection. Examples are given of innovations in smoke propagation monitoring and in signal evaluation in fire detection systems. Regulations and test methods for fire detection systems are of great importance, especially as far as international agreements are concerned.

49646 **(MESA-IR—1012) Panic bars and automatic brakes.** Lester, C.E. (Mining Enforcement and Safety Administration, Mt. Hope, WV (USA). Coal Mine Health and Safety). 1975. 26p. NTIS, PC A03/MF A01. Order Number DE83902987.

This publication illustrates the need for installation of panic bars that will permit rapid deenergization of equipment in emergencies and automatic emergency brakes on self-propelled electric face equipment used in coal mines. The publication contains drawings depicting actual fatal accidents that have occurred in underground coal mines which these safety devices could have prevented. Also included are drawings and technical data to be used to assist mine operating companies and equipment manufacturers in the design, installation, and maintenance of panic bars and automatic brakes.

4208 Electronic Circuits And Devices

REFER ALSO TO CITATION(S) 49224, 49520

49647 **(SAND—83-1769C) Power-loading effects in gas-discharge models.** Pitchford, L.C. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 6p. (CONF-830810—2). NTIS, PC A02/MF A01. Order Number DE83016504.

From DOE/FRG joint workshop on diffuse discharges; Bad Honneff, F.R. Germany (15 Aug 1983).

The effect is examined of the large discharge currents in the switch conduction stage on the transport and rate coefficients which appear in the rate equation for the electron density, the basic element in a discharge model. Measurements of translational and vibrational heating indicate that for the current levels of interest here, there will be significant heating. As a result, we must consider the related changes due to enhanced populations in the high energy states of the gas molecules: modified rates for translational gas heating and for excitation, dissociation, and perhaps ionization. It is concluded that it is primarily the high energy tail of the electron energy distribution that is affected. Thus, rate coefficients are more sensitive to power loading of the gas than are the drift velocity, average electron energy, and difusion rate. In terms of model predictions of switch performance, knowledge of the source function from the e-beam is important in calculations of switch current gain and for conductivities. These will be underestimated with the neglect of ionization produced by secondaries. The distribution function is modified at the high energies from its form characterized by E/N in the presence of the e-beam source. The subsequent changes in the rate coefficients due to the e-beam source and the excited state populations can affect the turn-on time of the switch.

49648 **(UCID—19080-82) Engineering Research Division publication report.** Miller, E.K.; Livingston, P.L. (Lawrence Livermore National Lab., CA (USA)). Jul 1983. Contract W-7405-ENG-48. 73p. NTIS, PC A04/MF A01. Order Number DE83016422.

This bibliography with abstracts lists citations of 118 formal reports in electronics engineering. (LEW)

4210 Combustion Systems

REFER ALSO TO CITATION(S) 48791

4220 Underground Engineering

49649 **(MESA-IR—1031) Investigation of the effects of thrust and hardened washers on the installed tension of a roof bolt.** Sawyer, S.G.; Karabin, G.J.; Debevec, W.J. (Mining Enforcement and Safety Administration, Pittsburgh, PA (USA). Pittsburgh Technical Support Center). 1976. 23p. NTIS, PC A02/MF A01. Order Number DE83902968.

The effects of thrust and hardened washers on the installed tension in a roof bolt were studied. Three sets of laboratory tests were run using 30-inch-long bolts with flat, bell, and donut plates, anchored with bail-type expansion shells in a specimen of Indiana limestone by a modified roof-bolting machine. Each type assembly, with and without hardened washers, was randomly installed at a fixed output torque for various levels of applied thrust from zero to 4000 lb. Two salient findings of the investigation were: (1) the application of thrust severely reduced the tension at which the bolts were installed, and (2) the use of hardened washers increased considerably the consistency of the installation of the bolts.

49650 **(MESA-IR—1050) Mine-ventilation pressure differentials with a programmable hand calculator: a supplement to Bureau of Mines Information Circulars 7809 and 8594.** Anderson, T.C.; Nugent, J.W. (Mining Enforcement and Safety Administration, Denver, CO (USA). Denver Technical Support Center; Mining Enforcement and Safety Administration, Pittsburgh, PA (USA). Pittsburgh Technical Support Center). 1977. 31p. NTIS, PC A03/MF A01. Order Number DE83902999.

Mine ventilation pressure differentials are calculated by various existing methods, including chart and slide rule manipulation, electronic desk calculators, and computers. This report shows that the speed and accuracy of a desk calculator can be matched with a programmable hand calculator in a field situation requiring mobility.

49651 (MESA-IR—1070) Fan curve preparation using programmable pocket calculators. Bruce, W.E. (Mining Enforcement and Safety Administration, Denver, CO (USA). Denver Technical Support Center). 1978. 22p. NTIS, PC A02/MF A01. Order Number DE83902545.

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It is often necessary and expedient to develop fan pressure-volume curves (fan characteristic curves) during onsite mine ventilation surveys. It is impossible to have characteristic curves available for every fan from each manufacturer, but some manufacturers supply specific-volume versus specific-speed curves for a large number of fan blade settings for all fans of a certain style or model. These specific-volume, specific-speed curves make it possible to develop the desired individual fan characteristic curve. Such specific-volume, specific-speed plots usually include efficiency data which also makes it possible to develop the fan input horsepower curves that correspond to the aforementioned characteristic curves. The extraction of data from the manufacturer's curves and the subsequent calculations constitute a time consuming process. For this reason, data from the manufacturer's specific-volume, specific-speed curves were tabulated and a successful effort was made to develop programmable pocket calculator programs which would expedite the calculations and help to insure the accuracy of the results.

49652 (MSHA/IR—1100) Operational analysis of point resin-anchored bolting systems. Karabin, G.J. Jr.; Hoch, M.T. (Mine Safety and Health Administration, Pittsburgh, PA (USA). Pittsburgh Technical Support Center). 1979. 16p. NTIS, PC A02/MF A01. Order Number DE83902832.

Over the past several years, the Roof Control Branch, Pittsburgh Technical Support Center, has been involved in the development and subsequent evaluation of resin point-anchored and combination bolting systems. These new support methods, utilizing both the excellent anchorage afforded by resin-grouted rods and the clamping force of tensioned members, add another dimension to roof support technology. This report traces the development of and theory behind resin-anchored tensioned bolts; documents both laboratory and underground demonstrations of their effectiveness; and finally, suggests installation guidelines through which the most efficient use of these systems can be achieved.

49653 (UCID—19867) Setting up boundary conditions for soil-structure interaction problems with DYNALK (a link from TENSOR to DYNA3D). Thigpen, L.; Peterson, J.C. (Lawrence Livermore National Lab., CA (USA)). Aug 1983. Contract W-7405-ENG-48. 25p. NTIS MF A01. Order Number DE83016914.

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This report provides instructions on the use of the DYNALK computer program to generate boundary conditions for a soil island used in soil-structure interaction problems. DYNALK converts temporal motions from 2-D TENSOR calculations into appropriate three-dimensional boundary conditions for a DYNA3D soil-structure interaction problem. The program is operational on the CRAY-1 computer.

4230 Marine Engineering

REFER ALSO TO CITATION(S) 48940

4240 Pollution Control Equipment

REFER ALSO TO CITATION(S) 49830, 49908

49654 (CONF-8305112—1) Control of alkali vapors by a granular-bed filter. Lee, S.H.D.; Myles, K.M.; Jonke, A.A. (Argonne National Lab., IL (USA)). 1983. Contract W-31-109-ENG-38. 21p. NTIS, PC A02/MF A01. Order Number DE83015367.

From 3. annual contractors' meeting on contaminate control in hot coal derived gas streams; Washington, PA, USA (23 May 1983).

Control of alkali vapors in the pressurized fluidized-bed combustion (PFBC) of coal is being studied in a laboratory-scale fixed granular-bed filter. The potential sorbents identified earlier were tested for their alkali vapor sorption in a gas stream with temperature (≧ 850°C), pressure (10 atm absolute), and composition closely simulating actual PFBC flue gas. The NaCl-vapor sorption efficiency of activated bauxite is > 99.8% and was found not to be diminished by HCl in flue gas. Diatomaceous earth has lower sorption efficiencies than activated bauxite. Emathlite, a fuller's earth, has a capability for NaCl-vapor capture. Its sorption behavior and preliminary sorption efficiencies are presented and discussed.

43 PARTICLE ACCELERATORS

49655 (INIS-mf—8040) Order of 27 April 1982 on the characteristics of particle accelerators as large nuclear installations. 19 May 1982. 1p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780782.

Published in the French Official Gazette.

The Decree of 1963, as amended by the Decree of 1973, regulates large nuclear installations in France and defines them. This Order determines the types of particle accelerator which is considered a large nuclear installation under the 1963 Decree. (NEA).

4301 Design, Development, And Operation

REFER ALSO TO CITATION(S) 48636, 50174, 50254, 50260, 50413

49656 (DOE/ER—0169) Report of the 1983 HEPAP Subpanel on New Facilities for the US high-energy physics program. (USDOE Office of Energy Research, Washington, DC). Jul 1983. 75p. NTIS, PC A04/MF A01. Order Number DE83016589.

The 1983 Subpanel on New Facilities of the High Energy Physics Advisory Panel (HEPAP) was formed in February 1983 and completed its report in July 1983. During the intervening 5 months the Subpanel held site meetings at three major accelerator laboratories, heard formal presentations from a number of prominent physicists, received almost 200 letters from members of the high energy physics community, and studied in depth all of the relevant written material. The final recommendations were arrived at after two lengthy deliberative meetings held in June and July at the National Academy of Sciences (NAS) Study Center at Woods Hole, Massachusetts, and at the Nevis Laboratory, Columbia University. The recommendations arrived at by the Subpanel are as follows: (1) the Subpanel unanimously recommends the immediate initiation of a multi-TeV high-luminosity proton-proton collider project with the goal of physics experiments at this facility at the earliest possible date; (2) the Subpanel recommends the rapid completion of current construction projects, Tevatron and the SLAC Linear Collider (SLC), the upgrading of the Cornell Electron Storage Ring (CESR) and associated detectors, and the thorough utilization of all existing facilities; (3) the Subpanel recommends that Fermilab not proceed at this time with the Dedicated Collider (DC); (4) by a majority vote, the Subpanel recommends that the Colliding Beam Accelerator (CBA) project at Brookhaven not be approved; (5) the Subpanel recommends that technology research and development, particularly advanced accelerator research and development, be strongly supported.

49657 (DOE/ER/40048—24-L2) SNEAP '82. (Washington Univ., Seattle (USA). Nuclear Physics Lab.). 1982. Contract AC06-81ER40048. 314p. (CONF-821066—). NTIS, PC A14/MF A01. Order Number DE83011616.

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

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SNEAP 82, the annual meeting of the Symposium of Northeast Accelerator Personnel, was held at the Seattle Center in Seattle, Washington on October 6-9, 1982. It was organized by the University of Washington Nuclear Physics Laboratory. A total of 73 participants represented 43 labs and companies from 8 countries. It is clear that SNEAP remains Northeast for purely historical reasons. This proceedings of SNEAP 82 was prepared from two sources, manuscripts of papers presented at the meeting, prepared by the speakers themselves, and tapes of discussions held during the

sessions. The transcriptions of the tapes have been edited to improve readability and clarity, with attention to preserving the flavor of the meeting. The content of the papers is the responsibility of the authors; the content of the discussions as transcribed here is partly the responsibility of the editor, who may not have understood every thing that was going on.

49658 (DOE/ER/40048—24-L2, pp 1-8) **Second step of the upgrading of the Strasbourg MP (16 MV - 18 MV).** Letournel, M.; Oberlin, J.C.; Heng, G.; Heugel, J.; Wagner, P. (Centre de Recherches Nucleaires de Strasbourg, France). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

We ran our MP at 18 MV for the first time in July. As was indicated last year at the Oak Ridge meeting, this second step consists essentially in two main parts. First, a Vivitron portico which takes care radially of the stored energy and the radial field. It was installed this spring. Second, a tube 96″ long was installed last fall.

49659 (DOE/ER/40048—24-L2, pp 13-18) **10 MV FN-pelletron at McMaster.** McKay, J. 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

Replacement of the beam tubes with spiral inclined tubes having aluminum electrodes, changing of the belt charging system to a pellet charging system, and performance testing of the upgraded machine are described. (GHT)

49660 (DOE/ER/40048—24-L2, pp 20-23) **Phenomenology of conditioning the Pelletron 12UD at UTTAC.** Seki, S. (Univ. of Tsukuba, Japan). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

Several typical phenomena observed during conditioning operation of the Pelletron 12UD at UTTAC are discussed. Since monitoring of the state of machine operation has been limited and indirect, causes of these phenomena have not been clear. We believe it useful to compare the phenomena observed at different machines.

49661 (DOE/ER/40048—24-L2, pp 24-31) **Experience with a 2 MV Pelletron accelerator tube conditioned with a low voltage discharge.** Walker, D.A.S. (Chalk River Nuclear Labs., Ontario). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

Long term accelerator tube deconditioning in a 2 MV Pelletron had restricted reliable accelerator operation to below ~ 1.5 MV. After the tube was subjected to a low voltage H_3 discharge for two hours, stable operation at 2 MV was reached within ten minutes of start-up. Details of the conditioning procedure and brief comments on accelerator operation in the ten months following conditioning are given.

49662 (DOE/ER/40048—24-L2, pp 41-43) **Time structure of x-rays observed from the Oak Ridge 25 MV Tandem Accelerator.** Jones, C.M. (Oak Ridge National Lab., TN). 1982. NTIS, PC A14/MF A01. (CONF-821066—). Contract W-7405-ENG-26.

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

Data are presented showing x-ray activity during conditioning. The diagnostic equipment which was used to record these data consists of a set of NaI detectors similar to those which have been described earlier and a storage oscilloscope. A storage scope is used because the time structure of interest cannot be seen with the unaided eye. Typically, these data were recorded at 10 to 20 msec/division.

49663 (DOE/ER/40048—24-L2, pp 75-83) **Second stripper for an EN or FN tandem accelerator.** Chapman, K.R. (Florida State Univ., Tallahassee). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

A second stripper has frequently been installed, part way down the high energy acceleration tube, in an MP or other very large tandem to achieve a higher particle energy and charge state. In an EN, FN or similar accelerator the space available in the dead section is very small, approximately 4″ in length and little more than the tube diameter transversely. The 4″ length must also accommodate the flexible bellows and vacuum seals that are necessary between the individual acceleration tubes. A stripper housing 22 foils 0.75″ diameter has been built and successfully installed, in this space, on the FN tandem accelerator at Florida State University. This accelerator has always operated with a 0.75″ dia aperture in this position so no loss of beam transmission occurs.

49664 (DOE/ER/40048—24-L2, pp 226-236) **Strasbourg project: a vivitron of 35 MV.** Letournel, M.; Coffin, J.P.; Frick, G. (Centre de Recherches Nucleaires de Strasbourg, France). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The Strasbourg project is a Van de Graaff tandem whose design incorporates some new features and ideas. All the electrical characteristics are very conservative, specially for the accelerating tube which is a standard one but the philosophy and some rules to build such an accelerator are new. There are still some fundamental tests to make before taking the final decision, which can come up around next spring. The main parts of our project are presented here.

49665 (DOE/ER/40048—24-L2, pp 239-242) **Hydraulic belt tension and tracking system for a Van de Graaff accelerator.** Janzen, H. (Queen's Univ., Kingston, Ontario). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

In order to eliminate machine openings for simple belt adjustment purposes, a hydraulic belt tension and tracking adjustment system has been developed. Two such independent systems operate one on the upper and one on the lower alternator pillow blocks. The basic belt tension of 4.4 kN (~ 1000 lb) force is applied to each of the pillow blocks by the hydraulic pistons. Basic fluid pressure of about 7.0 M Pag (~ 1000 psig) is maintained essentially constant by the relatively large volume of 1000 ml of dry nitrogen in the reservoir. The maximum travel of the piston is about 1.2 cm and the amount of fluid transferred to achieve this is about 80 ml which corresponds to less than 1% change in the reservoir gas volume or pressure, thus maintaining piston force, and hence the belt tension, essentially constant for a belt stretch of as much as 2.5 cm in total circumferential length. As the belt stretches the check valve between the reservoir and piston allows fluid to flow to the piston when the pressure differential exceeds ~ 70 k Pa (10 psi). Reverse fluid flow is blocked however, thus maintaining the mechanical rigidity of the piston in compression, which is essential for stability.

49666 (INFN-LNF—78/39(R)) **Radiation doses at an electron and positron Linac and storage ring.** Esposito, A.; Pelliccioni, M.; Rindi, A. (Istituto Nazionale di Fisica Nucleare, Frascati (Italy). Lab. Nazionale di Frascati). 18 Sep 1978. 13p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702410.

The INFN National Laboratory of Frascati (Italy) makes use of a higher energy Linac for different physics experiments and for feeding an electron-positron storage ring (ADONE). For radiation protection purposes a series of gamma dose measurements has been performed during the running of the accelerators along the Linac beam lines and the concrete tunnel that covers the Linac as well as along the storage ring.

49667 (INIS-SU—136, pp 92-102) **Technological factors effecting ferromagnet core pulse properties in the induction system of an induction linear accelerator.** Burtseva, N.A.; Konstantinov, Yu.A. 1981. (In Russian). NTIS (US Sales Only), PC A06/MF A01.

In Electrophysical apparatus. Issue 18. Collection of articles.

Technological factors of core production of the induction system of the LIA 30/250 linear induction accelerator and their effect on pulse characteristics of the cores are investigated. The technological process of core production comprised the following stages: clean-up of the tape, imposition of heat-resistant isolation, high-temperature annealing, pulse tests, core assembling. The process of electrophysical imposition of MgO suspension isolation with dispersion H_2O and CCl_4 media was investigated. It turned out that application of CCl_4 suspension gave essentially larger yield of cores with high pulse properties. Mechanical effects on the core during core assembly showed that axial and radial efforts slightly worsened the pulse properties. It is concluded that tape purity, thickness and quality of isolation, atmosphere and mode of high-temperature annealing produce the maximal effect on pulse properties of the cores.

49668 **(LBL—16437) Initial operation of the LBL heavy ion RFQ.** Staples, J.; Gough, R.; Schneider, H.; Zajec, E. (Lawrence Berkeley Lab., CA (USA)). Aug 1983. Contract AC03-76SF00098. 6p. (CONF-830822—2). NTIS, PC A02/MF A01. Order Number DE83016314.

From 12. international conference on high energy accelerators; Batavia, IL, USA (11 Aug 1983).

The LBL heavy ion RFQ accelerator, a 200 MHz structure that accelerates an ion with q/A ≧ 1/7 from 8.4 to 200 keV/n, has now passed all its acceptance tests. This machine is unique in several respects: it uses coupling rings between vanes to stablize the azimuthal field distribution, it incorporates a vane mounting system that simplifies vane alignment, it uses no end tuners or power distribution manifold, and it needs only one rf feed loop. The beam performance of this machine is reported in this paper.

49669 **(LBL—16502) Vane-coupling rings simplify tuning of the LBL RFQ accelerator.** Lancaster, H.; Gough, R.; Howard, D.; Schneider, H.R. (Lawrence Berkeley Lab., CA (USA)). Aug 1983. Contract AC03-76SF00098. 6p. (CONF-830822—3). NTIS, PC A02/MF A01. Order Number DE83016318.

From 12. international conference on high energy accelerators; Batavia, IL, USA (11 Aug 1983).

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A new heavy ion RFQ accelerator has been commissioned as part of a Bevalac injector upgrade project. This RFQ is the first four vane type to incorporate vane coupling rings (VCR's) as part of the structure. This paper reports on the simplified tune up procedure made possible by the use of VCR's including field flattening, end tuning, and frequency adjustment. Also included is a discussion of high power performance including conditioning.

4302 Beam Dynamics, Field Calculations, And Ion Optics

REFER ALSO TO CITATION(S) 49718

49670 (DOE/ER/40048—24-L2, pp 92-98) **Plasma lens for an MeV-ion microprobe.** Connolly, R.C.; Sieger, G.E.; Lefevre, H.W. (Univ. of Oregon, Eugene). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The radial self electric field of a trapped electron column is used for precision focusing of 2 to 4 MeV ion beams in a scanning ion microprobe with 64 cm focal length and 8.65 demagnification ratio. Beam ray tracing and plasma ion energy measurements give electron densities of 3 to 9 x 10^9 cm^{-3}, column lengths of 13 to 18 cm, and electron half density radii of 4.5 to 7.5 mm. Standing RF plasma waves are excited and observed, and, together with focusing observations, indicate many plasma modes of different focusing strengths and stability characteristics. Stray 60 Hz fields along the beam line limit the focused spot size to 11.6 μm, but beam rastering observations indicate that the lens is capable of producing a 5 μm spot.

49671 (DOE/ER/40048—24-L2, pp 243-251) **Magnetic suppression gridded lens system at the entrance of a tandem accelerator.** Schmidt, F.H.; Weitkamp, W.G. (Univ. of Washington, Seattle). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

A gridded lens, affixed to the first insulated electrode at the entrance to the accelerator tube of our Model FN Tandem, was first installed about 2-1/2 years ago. It was an apparent instant success; the transmission of the Tandem for heavy ions from a sputter source was increased from about 30% to about 60%, and the dependence of low energy focussing parameters on terminal potential was substantially reduced. These benefits are to be expected because the effective lens at the entrance to the tube is weakened. The increase in size of the entrance pupil also manifests itself as a reduced sensitivity to low energy beam steering. However, after some months of operation, Tom Trainor showed that fluctuations in the beam (on a time scale of 1 to 4 seconds) were caused by the grid. Months later, it was noted that the accelerated beam was displaced sideways (~ 1 to 2 cm) as it emerged from the high energy tube. About one year ago, the grid produced, severe electrical breakdown in the first (straight) section of the accelerating tube. The maximum useful terminal potential was limited to ~ 6.5 MV. A fourth ailment was induced by grid operation. Even with moderate-sized beams an unusual amount of x-radiation was produced on a monitor placed outside the tank midway between the terminal and the low-energy end. In this paper we describe the technique used to reduce these effects.

49672 **(FRNC-TH—1092) Studies and comparisons of two photon-tagging systems for the production of monochromatic photon beams for photonuclear experiments.** Aniel, Thierry. (Paris-11 Univ., 91 - Orsay (France)). Jun 1982. 281p. (In French). NTIS (US Sales Only), PC A13/MF A01. Order Number DE83702812.

Thesis.

The performance of photon beams obtained by two different tagging processes (tagging of "hard" annihilation photons with "soft" associated photons, tagging of bremstrahlung photons with associated electrons) on the same facility was studied. The two processes are described and experimental results on the characteristics of the resulting beams given. The respective advantages of both methods are compared with one another and with those of a quasi-monochromatic beam obtained by the in-flight annihilation of a positron beam. A development based on the second process is then studied together with its applications to photonuclear physics.

49673 **(UCID—19846) Beam-head erosion in a highly conductive background.** Buchanan, H.L. (Lawrence Livermore National Lab., CA (USA)). 26 Apr 1983. Contract W-7405-ENG-48. 13p. NTIS, PC A02/MF A01. Order Number DE83016523.

An analytic estimate of beam heat erosion in a highly conductive background is presented and compared to numerical results. Model equations are derived and forced into a self-similar form from which parameter scalings are easily obtained. It is found that erosion in this limit is driven by scattering and is very rapid for high conductivities (≧ 10^{11}) due to the high fraction of current neutralization.

4303 Auxiliaries And Components

REFER ALSO TO CITATION(S) 49533, 49657, 50153, 50265

49674 **(BNL—33368) Hadron-hadron colliders.** Month, M.; Weng, W.T. (Brookhaven National Lab., Upton, NY (USA)). 21 Jun 1983. Contract AC02-76CH00016. 159p. (CONF-8208147—3). NTIS, PC A08/MF A01. Order Number DE83015395.

From SLAC summer school on high-energy particle accelerators; Stanford, CA, USA (2 Aug 1982).

The objective is to investigate whether existing technology might be extrapolated to provide the conceptual framework for a major hadron-hadron collider facility for high energy physics ex-

perimentation for the remainder of this century. One contribution to this large effort is to formalize the methods and mathematical tools necessary. In this report, the main purpose is to introduce the student to basic design procedures. From these follow the fundamental characteristics of the facility: its performance capability, its size, and the nature and operating requirements on the accelerator components, and with this knowledge, we can determine the technology and resources needed to build the new facility.

49675 **(DOE/ER/02167—T1) 83-inch cyclotron research program. Final report.** Parkinson, W.C. (Michigan Univ., Ann Arbor (USA). Dept. of Physics). Jul 1983. Contract AC02-76ER02167. 58p. NTIS, PC A04/MF A01. Order Number DE83015827.

In June of 1960 the US Atomic Energy Commission authorized the construction of a modern variable energy cyclotron facility at The University of Michigan to be used for research in nuclear spectroscopy. The Legislature of the State of Michigan made available funds for construction of a building to house the 83-inch cyclotron and auxiliary equipment as well as the University's remodeled 42-inch cyclotron. The research program centered around the 83-inch cyclotron was funded by the AEC and its successors, the Energy Research and Development Administration (ERDA) and the Department of Energy (DOE), from September 1964 through March 1977. The program represented a continuation of the research effort using the 42-inch cyclotron facility which had been supported continuously by the AEC since February 1950. This final report to DOE briefly describes the research facility, the research program, and highlights the principal accomplishments of the effort. It begins with a historical note to place this effort within the context of nuclear physics research in the Department of Physics of the University of Michigan.

49676 **(DOE/ER/13000—T2) SSRL activity report for April 1, 1982-March 31, 1983. SSRL report 83/01.** Cantwell, K. (ed.). (Stanford Univ., CA (USA). Stanford Synchrotron Radiation Lab.). 1983. Contract AC03-82ER13000. 239p. NTIS, PC A11/MF A01. Order Number DE83016672.

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This annual research summary includes an overview of the ten years of SSRL operation. Following the overview, these topics are covered: review of laboratory operations; beam line developments and improvement projects; future plans for SSRL enhanced photon flux facility, and planning for new storage rings; SSRL advisory panels and organization; experimental progress reports; theses based on work at SSRL; active proposals; SSRL experimenters and proposals by institution; publications based on work at SSRL; and active SSRL proposals by research areas. (GHT)

49677 (DOE/ER/40048—24-L2, pp 32-40) **Voltage conditioning and beam performance of the 2OUR Pelletron at JAERI.** Norton, G.A.; Sundquist, M.L.; Daniel, R.E.; Rathmell, R.D. (National Electrostatics Corp., Middleton, WI). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The Pelletron Model 2OUR was formally accepted by the Japan Atomic Energy Research Institute in Tokai, Japan, on August 10, 1982. The 2OUR is a 20 MV, folded tandem with a 300 kV injector with four ion sources on the injector deck. The 2OUR is equipped with an internal ion source and nanosecond bunching and pulsing system in the high voltage terminal. This ion source and pulsing system is designed to produce intense peak currents of proton and deuteron beams. The accelerator is also equipped with an external nanosecond bunching and pulsing system for nanosecond pulsed beams in the tandem mode for ions up to mass 240. The formal acceptance of the accelerator was based on operation at 18 MV. However, the 2OUR has operated in a very stable fashion, accelerating an oxygen beam with a terminal potential of 18.5 MV. Mechanical deficiencies outside of the accelerating tube presently limit operation below 20 MV.

49678 (DOE/ER/40048—24-L2, pp 44-53) **NSF regional accelerator facility for radioisotope dating at the University of Arizona.** Zabel, T.H.; Jull, A.J.T.; Donahue, D.J.; Damon, P.E. (Univ. of Arizona, Tucson). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The 3 MV tandem accelerator mass spectrometer at the University of Arizona was delivered and installed by General Ionex Corporation in September, 1981. The machine was originally designed as an ultrasensitive mass spectrometer for ^{14}C, and is in the process of being upgraded to do ^{36}Cl and other rare isotopes as well. In this paper only the performance characteristics of the machine that relate to ^{14}C work are discussed.

49679 (DOE/ER/40048—24-L2, pp 54-61) **Ion transport and detection systems for Isotrace.** Kilius, L.R. (Univ. of Toronto, Ontario). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

A discussion is presented on the development of an ion transport system at the Isotrace (ISOTope and Rare Atom Counting Equipment) Laboratory to accommodate heavy element studies and searches for rare and exotic ions. Although the emphasis will be primarily on the high energy analysis system, a brief description of the various ion injectors under construction at Isotrace (i.e., for ion microprobe studies) is also described.

49680 (DOE/ER/40048—24-L2, pp 62-69) **OSIRIS heavy ion accelerator mass spectrometer.** Greenway, T.J.L.; Chew, S.H.; Garman, E.F.; Allen, K.W. (Oxford Univ., England). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The Nuclear Physics Laboratory has collaborated with the Research Laboratory for Archaeology and the History of Art at Oxford in setting up a ^{14}C dating accelerator. OSIRIS is a complementary system for heavy ions using the Nuclear Physics EN tandem.

49681 (DOE/ER/40048—24-L2, pp 99-104) **Computer control of the magnetic beam transport system.** Trainor, T.A. (Univ. of Washington, Seattle). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The computer-controlled magnet system for the University of Washington FN tandem was developed to provide rapid beam transport setup referenced to a single parameter (the NMR frequency) and the ability to do computer controlled excitation curves or other multistep changes in magnetic rigidity (e.g., repetitive alternation between ion species) at low cost and with a simple flexible structure. In addition it was desired to provide easy switching from computer to manual control in the event of equipment failure or special applications.

49682 (DOE/ER/40048—24-L2, pp 105-107) **Numerically controlled NMR.** Fauska, H. (Univ. of Washington, Seattle). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

Nuclear magnetic resonance devices have been very important for measuring and controlling analyzing magnet fields for accelerator beams. The accelerator operator usually adjusts the magnet current until the NMR absorption signal apears on an oscilloscope. The NMR frequency is a very sensitive measure of magnet flux and from this the particle energy can be determined accurately. An automatic regulation system which sweeps the magnetic field in our analyzing magnet +-500 kHz and then locks into regulation was reported on at an earlier conference. The regulator has proven so useful on our original gaussmeter that we started design of a further improvement, a regulatory which could be set to the desired frequency by a digital computer, and a frequency synthesizer which would maintain that frequency until an update was requested. We then would use a regulator similar to one reported earlier. Through such a system together with a system to computer select the correct focusing, switching and analyzing magnet currents, we can provide complete computer control for experiments involving rapid or systematic changing of particle energy.

49683 (DOE/ER/40048—24-L2, pp 108-117) **Survey of E-division accelerators at the Lawrence Livermore National Laboratory.** Proctor, I.D. (Lawrence Livermore National Lab., CA). 1982. NTIS, PC A14/MF A01. (CONF-821066—). Contract W-7405-ENG-48.

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The Experimental Physics Division (E-Division) at the Lawrence Livermore National Laboratory conducts research in basic and applied nuclear and atomic physics and materials science. Most of the research within the Division utilizes one of three facilities: an intense 14-MeV neutron source, a 27-MeV cyclograaff (consisting of a 15-MeV cyclotron and a 6-MV tandem van de Graaff), and a 100-MeV electron linac. A brief description of each facility is presented with emphasis on the research capabilities presently available.

49684 (DOE/ER/40048—24-L2, pp 118-124) **University of Oxford: status of the folded tandem.** Greenway, T.J.L. (Univ. of Oxford, England). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The Folded Tandem is now the mainstay of the nuclear structure program and was scheduled for the maximum possible time. The belt was running for 5897 hours during the year, with beam available for 5054 hours, a 10% increase over the previous year, due to increased reliability and the absence of any major alterations to the accelerator. Only essential maintenance was carried out. The machine was opened nineteen times, of which two were unscheduled. The remainder were for foil changes and scheduled maintenance. One unscheduled opening was for replacing the first HVEC belt which had failed after 7000 hours. The second unscheduled opening was for a faulty ADC in the link monitoring the terminal RF source. The link has otherwise been very reliable and has conferred the ability to monitor minor faults and to continue operation when it is safe to do so. Details about machine performance, beam currents and beam transmission are discussed.

49685 (DOE/ER/40048—24-L2, pp 125-143) **Installation of the Stony Brook superconducting linac.** Noe, J.W. (State Univ. of New York, Stony Brook). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

An overview is given of our entire project and of the way our laboratory will look when it is finished. The project is a superconducting RF linear accelerator based on lead-plated copper split-loop resonantors, which will give an energy gain equivalent to 20 million volts of DC potential drop.

49686 (DOE/ER/40048—24-L2, pp 144-151) **1982 SNEAP report on the Oak Ridge 25 MV tandem accelerator.** Ziegler, N.F.; Richardson, E.G.; Mann, J.E.; Juras, R.C.; Jones, C.M.; Galbraith, D.M.; Biggerstaff, J.A.; Benjamin, J.A.; Alton, G.D. (Oak Ridge National Lab., TN). 1982. NTIS, PC A14/MF A01. (CONF-821066—). Contract W-7405-ENG-26.

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The period since SNEAP-1981 has been almost equally divided between work by NEC and operation of the accelerator for the facility experimental program. A summary is given.

49687 (DOE/ER/40048—24-L2, pp 152-158) **Buenos Aires TANDAR facility.** Ferreira, E.P.; Mariscotti, M.A.J.; Ventura, E. (CNEA, Buenos Aires, Argentina). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

Since our last report at Oak Ridge, progress has been made in the building construction, machine assembly, gas handling system, data acquisition system and peripheral equipment. The Buenos Aires TANDAR facility consists of a NEC 20 UD Tandem and auxiliary equipment and is the only straight NEC machine (not folded) with a designed voltage above 14 MV. Although this makes it more expensive, the option was taken for the sake of reliability.

49688 (DOE/ER/40048—24-L2, pp 159-164) **Chalk River MP Tandem Accelerator and superconducting cyclotron 1982 laboratory report.** Hurley, P.I. (Chalk River Nuclear Labs., Ontario). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The Chalk River MP Tandem Accelerator operated reliably until May 10 when it was shut down to prepare the accelerator for use as an injector for a heavy ion superconducting cyclotron. While the Tandem physics experimental program continued, our efforts were directed as much as possible towards preparations for installing the cyclotron. By September 30 the HVEC stainless steel high gradient tubes, installed in 1972, had accumulated 63,066 hours of operation. The Pelletron charging system had operated for 49,066 hours and had 10,982 hours on its second set of chains. The chains had run essentially trouble free during the past year. A cut-away view of the MP Tandem and superconducting cyclotron complex is shown. The cyclotron and its injection and extraction beam transport system are being assembled. A cyclotron bypass beam line is being installed so that the MP Tandem physics program can be continued.

49689 (DOE/ER/40048—24-L2, pp 166-168) **1982 SNEAP tandem-linac accelerator report.** Hartog, P.D.; Pardo, R.; Munson, F.; Heath, C. (Argonne National Lab., IL). 1982. NTIS, PC A14/MF A01. (CONF-821066—). Contract W-31-109-ENG-38.

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

Operation of the tandem Van de Graaff facility is described. A brief description is given of modifications to the machine, operating time, and beam currents. (GHT)

49690 (DOE/ER/40048—24-L2, pp 169-170) **Universitaet of Bochum tandem report.** Brand, K. (University of Bochum, Germany). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

This brief status report discusses the replacement of the Dynamitron beam tube to decrease secondary electrons in the tubes and improve machine efficiency. Some test data are given for the new tube. Some performance figures are also given for the post-acceleration gas stripper. (GHT)

49691 (DOE/ER/40048—24-L2, pp 171-172) **Brookhaven National Laboratory tandem facility.** Lindgren, R. (Brookhaven National Lab., Upton, NY). 1982. NTIS, PC A14/MF A01. (CONF-821066—). Contract AC02-76CH00016.

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

Performance of the two tandem accelerators, MP7 and MP6 is described. The MPG was converted to a Pelletron charging system, and the reliability after 13,500 hours is discussed. An incident in which Phosphorus 32 was detected in the MP7 led to the conclusion that it resulted from the nuclear reaction $^{32}S(n,p)^{32}P$, occurring in the insulating gas during acceleration of a D_2 beam. (GHT)

49692 (DOE/ER/40048—24-L2, pp 173) **Chalk River high voltage mass separator - 1982.** Walker, D.A.S. (Chalk River Nuclear Labs., Ontario). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

Modifications made to the gas storage system for the 2MV Pelletron are briefly described. Operating reliability of the charging pulleys is discussed. (GHT)

49693 (DOE/ER/40048—24-L2, pp 175-176) **Florida State University tandem report, September 14, 1981-September 14, 1982.** Chapman, K. (Florida State Univ., Tallahassee). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The tandem has run well during the year and its utilization is shown. Much of our effort during the year has been devoted to work on the booster project and preparations for it, while the experimental program has continued with very little interruption.

49694 (DOE/ER/40048—24-L2, pp 177-178) **University of IFE FN tandem accelerator project, 1982 progress report.** Oso, G.A. (Univ. of Ife, Nigeria). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The tandem accelerator project at the University has been making progress but, behind schedule. The major accelerator equipment has been manufactured since 1981 but is presently being stored with HVEC because the accelerator building is not yet ready. Work on the accelerator building started in May 1982 and the building is presently at foundation stage. The scheduled completion period is approximately 20 months and we expect to move in the accelerator tank about April next year.

49695 (DOE/ER/40048—24-L2, pp 179-180) **Laboratory report for SNEAP, October 1982.** Wallace, G. (Inst. of Nuclear Science, Lower Hutt, New Zealand). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The accelerator facility is described, including the KN-3 MV Accelerator and the EN-6 MV tandem Van de Graaff. Modifications of the accelerators are discussed. (GHT)

49696 (DOE/ER/40048—24-L2, pp 181-183) **SNEAP 1982 progress report.** 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The arrival of the Tandetron Accelerator Mass Spectrometry System from General Ionex Corporation (GIC) in March 1982 marked the beginning of visible work in the IsoTrace (IsoTope and Rare Atom Counting Equipment) Laboratory. The intervening months prior to ion beam tests were dedicated to the assembly, development and testing of all sub-systems. Voltage tests began in early September and were followed by initial conditioning to a potential of 1.8 MV. A C12 beam was accelerated at this potential, and C12 (+2) was magnetically analyzed by mid-September. The events during the apparently long hiatus between the delivery of the accelerator and the initial beam diagnostics are described in detail.

49697 (DOE/ER/40048—24-L2, pp 184-186) **Isotrace sulphur hexafluoride handling system.** Finn, C.W.; Kieser, W.E.; McKenna, J.P. (Univ. of Toronto, Ontario). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

At the SNEAP 1981 Conference, we reported on the design of the sulphur hexafluoride gas handling system for the IsoTrace 3 MV Tandetron accelerator. This system has now been installed and tested and in the past few weeks we have acquired some experience operating it. The system incorporates several unusual features: PVC pipe for the gas transfer lines, neoprane bags for storage of the gas and an oil lubricated compressor. This report discusses each of these features in greater depth and then give some typical operating details. A diagram of the entire system is shown.

49698 (DOE/ER/40048—24-L2, pp 187) **Los Alamos National Laboratory 3-stage Van de Graaff accelerator facility.** 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

This year we have had two protracted scheduled shutdown periods during which time most of the developments reported were accomplished. Changes in the vacuum system, resistors, and control system of the tandem are reported. Changes in beam tubes on the single-ended vertical machine are discussed, along with replacement of the charging belt. (GHT)

49699 (DOE/ER/40048—24-L2, pp 188-189) **McMaster tandem accelerator laboratory report to SNEAP, 1982.** 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The highlight of the past year was the installation of new Dowlish spiral inclined aluminum tubes and a National Electrostatics Corp. Pelletron charging system in the FN Tandem. The KN Accelerator has been operating steadily all year at terminal potentials from 500 KV to 3.1 MV, with target currents from less than 10 nA to 200 μA of He^+ and H^+. There has been only the usual routine maintenance to be performed on the ion source and ancillary equipment.

49700 (DOE/ER/40048—24-L2, pp 190-191) **University of Pittsburgh laboratory report.** Saylor, T.K.; Dunkle, R.F.; Easterbrook, M.P. (Univ. of Pittsburgh, PA). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The University of Pittsburgh Nuclear Physics Lab has two EN tandem accelerators from HVEC. A modified Extrion UNIS sputter source is in the high voltage terminal of the negative injector tandem for 3-stage acceleration. A second UNIS source or an old HVEC model SO-66 duo-plasmatron source are used for injecting the positive tandem in two-stage operation.

49701 (DOE/ER/40048—24-L2, pp 192-194) **SNEAP 1982 laboratory report, Accelerator Laboratory.** Janzen, H. (Queen's Univ., Kingston, Ontario). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

During the year from October 1, 1981 to September 30, 1982 the Van de Graaff was run for a total beam time of approximately 1500 hours. In this time period 78 days were spent on machine maintenance, involving 10 tank openings; 50 days were spent on upgrading and 37 days on test or conditioning runs. Details of the downtime are discussed.

49702 (DOE/ER/40048—24-L2, pp 195-196) **Laboratory report, October 1981-October 1982: Nuclear Structure Research Laboratory, University of Rochester.** Miller, T.E.; Lund, T.S.; Kelly, D. (Univ. of Rochester, NY). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

Since the last SNEAP meeting the MP tandem has been running quite reliably, with many experiments over 12.25 MV on terminal. Our highest terminal voltage with beam was at 12.4 MV, and was used to produce 164 MeV Ca^{+13} ions. The laboratory is still operating around the clock 7 days a week, with experiments operating the machine on weekends. A major addition to the laboratory occurred during the summer with the delivery of our new VAX 11/750 computer system. The VAX has two satellite LSI 11/23 processors with CAMAC data acquisition systems. These two independent systems will allow one experiment to be taking data while another is being set up and debugged. The LSI 11/23 satellite computers will pre-process and manage data received from the CAMAC branch drivers. Two TU-77 125"/sec tape drives and a RM 80 disk will be used for data storage. Software for the VAX is being developed jointly by the Laboratory and the Kellogg Radiation Laboratory at Caltech.

49703 (DOE/ER/40048—24-L2, pp 197) **Stony Brook tandem - LINAC facility.** Noe, J.W. (State Univ. of New York, Stony Brook). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The major effort at Stony Brook during the year ending October 1, 1982 has been to complete assembly of the new Superconducting LINAC and to carry out major improvements in the LINAC target area and various beam lines, including installation of the new 400 kV heavy ion injector system and double-drift buncher. Requests for beam time were greatly reduced as old re-

search programs were terminated in anticipation of these modifications. Total operating hours on FN-8 were 2270 prior to the complete shut down on May 14. The timetable for bringing the full tandem-LINAC accelerator into operation calls for first beam testing of the new ion source and bunching systems in November and December, leading to beam tests of the complete LINAC in early January of 1983.

49704 (DOE/ER/40048—24-L2, pp 198-199) **1982 UTTAC laboratory report.** 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

During the past year the tandem machine has been operated for 3400 hrs, in which beam acceleration time for research experiments was 2400 hrs. Several machine troubles occurred which needed considerable time for repair and conditioning. Four units of accelerator tubes have been replaced as indicated.

49705 (DOE/ER/40048—24-L2, pp 200-201) **Triangle Universities Nuclear Laboratory.** Westerfeldt, C. (Duke Univ., Durham, NC). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

New projects initiated since the previous SNEAP meeting are: installation of a new terminal stabilizer; development of a beam optics logging facility using a microcomputer; development of a 20 MHz post-acceleration chopper; installation of a stainless-steel-electrode beam tube in the 3 MeV Van de Graaff, along with a terminal stabilizer; and installation of a new direct extraction ion source for the injector cyclotron. (GHT)

49706 (DOE/ER/40048—24-L2, pp 202-203) **Western Michigan University 1982 SNEAP Laboratory report.** Ferguson, S.M.; Parpart, L.R. (Western Michigan Univ., Kalamazoo). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

Western Michigan University has an EN tandem Van de Graaff which was moved from the Argonne National Laboratory in 1970. The accelerator has never been funded on a continuing basis by the federal government. We received one large grant when the tandem was installed and several smaller grants since then. We have also received several grants from private foundations. University support consists of two staff positions and about $4000 a year for supplies.

49707 (DOE/ER/40048—24-L2, pp 204-205) **SNEAP 82 laboratory report, Nuclear Physics Laboratory, University of Washington.** 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

Projects for the accelerator are described. The first is the installation of a system to stabilize the beam position at the image slits of the 90 degree analyzing magnet. The second is the installation of a new upcharge control circuit on the injector tandem. Beam monitors have been improved, and the charging belt has been replaced. Comment is made on ion source projects, the momentum filter spectrograph, and a proposal to construct a superconducting booster. (GHT)

49708 (DOE/ER/40048—24-L2, pp 206-210) **University of Wisconsin laboratory report for SNEAP - 1982.** Billen, J.H. (Univ. of Wisconsin, Madison). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The EN tandem Van de Graaff facility is described. Pelletron charging chains were replaced after 52,804 hours of operation. A polarimeter was installed to monitor either proton as deuteron polarization at the exit of the analyzing magnet. Work on a Cs gun for the colliding-beam polarized ion source is described. Computer codes have been developed to model the operation of the sputter ion source. A RF buncher for deuterons with energies between 10 and 60 keV has been installed to improve time-of-flight measurements. (GHT)

49709 (DOE/ER/40048—24-L2, pp 217-225) **Upgrading Sargent-Welch turbopumps.** Noe, J.W. (State Univ. of New York, Stony Brook). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

The upgrade discussed consists of modification of pump bearings, a new and better baffled foreline, and a direct-drive motor. Performance is discussed. (GHT)

49710 (DOE/ER/40048—24-L2, pp 261-267) **Ion source development at Argonne.** Billquist, P.J.; Yntema, J.L. (Argonne National Lab., IL). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

To do effective ion source development work, it is necessary, among other things, to have a good test facility. The test stand which we have built in the last two years is shown. It uses a 90° double-focussing magnet with a mass energy product of about 10 and a Δ m/m of about 1/130. The test stand should accommodate different sources. The negative ion beam from the ion source is focussed and accelerated with a NEC general purpose acceleration tube with a built-in einzel lens and changeable extraction electrodes. We have variable slits at the focal points of the magnet. A NEC movable Faraday cup is located ahead of the slits. This cup is used to measure the total beam from the source. In addition, there is a NEC beam profile monitor in the 0° beam line. After the magnetic analysis, we have another NEC movable Faraday cup and a version of the Wisconsin beam emittance measurement device. Our three usable sources: a copy of SNICS, an ANIS source which was purchased from NEC, and the inverted sputter source. Our development work in the last year has been concentrated on the inverted sputter source.

49711 (DOE/ER/40048—24-L2, pp 268-273) **First operation of the Stony Brook 400 kV heavy-ion injector.** Noe, J.W. (State Univ. of New York, Stony Brook). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

It should be noted that the first operation mentioned in the title refers to the factory demonstration tests at General Ionex Corporation in July of this year. Following these tests, the injector was shipped in late August to Stony Brook, where it is now being installed. Our schedule calls for first beam tests in November, and regular operation with the tandem by the end of 1982.

49712 (DOE/ER/40048—24-L2, pp 281-299) **Computer modelling of a sputter-type negative-ion source.** Billen, J.H. (Univ. of Wisconsin, Madison). 1982. NTIS, PC A14/MF A01. (CONF-821066—).

From Symposium for Northeastern Accelerator personnel; Seattle, WA, USA (6 Oct 1982).

Results of Cs^+ ion trajectory calculations that correctly predict the erosion pattern observed on the sputter cathode of our Source of Negative Ions by Cesium Sputtering (SNICS) were reported earlier. The calculations have been extended to include the negative ions sputtered from the cathode surface making it possible to construct the phase space distribution of the negative ion beam and hence calculate the beam emittance and current. A few highlights are presented of the results obtained so far with the computer model. The calculations involve a tremendous computational effort and would have been nearly impossible without the use of a very high speed machine.

49713 **(DOE/SF/00515—T18) Stanford Linear Accelerator Center monthly report for July 1982.** (Stanford Linear Accelerator Center, CA (USA)). 1982. Contract AC03-76SF00515. 17p. NTIS, PC A02/MF A01. Order Number DE83015340.

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Operational activities for the month of July 1982 are reported in the areas of accelerator and research operations, research area and experiment status, accelerator improvements, research division developments, PEP division developments, and publications for the month. (GHT)

49714 **(DOE/SF/00515—T19) Stanford Linear Accelerator Center monthly report for April 1982.** (Stanford Linear Accelerator Center, CA (USA)). 1982. Contract AC03-76SF00515. 23p. NTIS MF A01. Order Number DE83015336.

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Operational activities for the month of April 1982 are reported in the areas of accelerator and research operations, research area and experiment status, accelerator improvements, research division developments, PEP division developments, and publications for the month. (GHT)

49715 **(INFN-LNF—78/8(R)) Magnetic system using at LEALE for changing the photon-beam angle.** Di Giacomo, P.; Lucherini, V. (Istituto Nazionale di Fisica Nucleare, Frascati (Italy). Lab. Nazionale di Frascati). 3 Feb 1978. 6p. (In Italian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702394.

At the LEALE laboratory a monochromatic photon beam with energy in the range 80-300 MeV is available. Photons are produced by positron annihilation on a liquid hydrogen target. The paper describes the apparatus used to change the angle of positrons on the annihilation target between 0/1.5° and then the angle of the photon beam.

49716 **(INFN-LNF—78/31(R)) Numerical study of the characteristics of the LEALE photon beam.** Lucherini, V.; De Sanctis, E.; Di Giacomo, P. (Istituto Nazionale di Fisica Nucleare, Frascati (Italy). Lab. Nazionale di Frascati). 7 Jul 1978. 21p. (In Italian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702419.

At the LEALE laboratory a monochromatic photon beam with energy in the range 80/300 MeV is available. Photons are produced by positron annihilation on a liquid hydrogen target. The characteristics of the beam are calculated for various conditions (positron energy, photon collimator, target thickness), taking into account the effects contributing to the beam spreading (energy loss and multiple scattering of protons in the annihilation target, energy distribution and angular divergence of the positron beam).

49717 **(INFN-LNF—78/34(R)) Resonant nuclear scattering of γ-rays as a tool to investigate the Ladon beam characteristics.** Caloi, R.; Casano, L.; Federici, L.; Frullani, S.; Giordano, G.; Matone, G.; Mattioli, M.; Pasquariello, G.; Picozza, P.; Prosperi, D. (Istituto Nazionale di Fisica Nucleare, Frascati (Italy). Lab. Nazionale di Frascati). 28 Jul 1978. 12p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702393.

It is shown how the 15.11 MeV (1^+) level in ^{13}C can be a good candidate for an accurate determination of the beam energy spread of the LADON photon beam together with its polarization degree. Typical counting rates and running time are deduced for a good significance of the suggested measurement.

49718 **(INIS-mf—8145) Periodically pulsed mode of operation of magnet systems in particle accelerators.** Stange, G. (Technische Univ. Braunschweig (Germany, F.R.). Fakultaet fuer Maschinenbau und Elektrotechnik). 6 Jun 1980. 81p. (In German). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702795.

Thesis.

Since in many applications in particle accelerator technology the beam duty factor, defined by the ratio of beam pulse length to the pulse to pulse period, is very small- typically in the order of 10^{-2} to 10^{-3} - it is interesting to operate the beam optical magnetic system in the periodically pulsed mode as well. Thus, by reducing the average Ohmic losses, it is possible to save energy and material. The pulsed mode of operation of magnet systems is especially adapted to those of linear accelerators and their beam transport systems, since linear accelerators are exclusively operated in this mode. But it is equally suitable for transport systems between cyclic accelerators and large storage rings as they are under development at present.

49719 **(LBL—15987) Technology of superconducting accelerator dipoles.** Hassenzahl, W.V.; Meuser, R.B.; Taylor, C. (Lawrence Berkeley Lab., CA (USA)). Jun 1983. Contract AC03-76SF00098. 75p. (CONF-8208147—2). NTIS, PC A04/MF A01. Order Number DE83016470.

From SLAC summer school on high-energy particle accelerators; Stanford, CA, USA (2 Aug 1982).

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We discuss accelerator dipoles and their characteristics. Other types of magnets, in particular bubble chamber magnets have been quite successful. Their performance is based on cryogenic stability which is addressed only briefly in this chapter. This type of stability is not available to the accelerator designer because of the large quantities of copper or other stabilizer that would reduce the current density in the windings to an unacceptably low value.

49720 **(LBL—16148) Data acquisition at the Bevalac - an example: the HISS facility.** McParland, C. (Lawrence Berkeley Lab., CA (USA)). Jun 1983. Contract AC03-76SF00098. 5p. (CONF-830576—14). NTIS, PC A02/MF A01. Order Number DE83016139.

From Real-time computer applications in nuclear and particle physics conference; Berkeley, CA, USA (16 May 1983).

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The Heavy Ion Spectrometer System (HISS) is a relativistic heavy ion research facility at the Bevalac accelerator complex, Lawrence Berkeley Laboratory (LBL). This spectrometer can provide fields of up to 30K gauss within a volume of more than 3 cubic meters. This facility is equipped with a number of large, flexible detector systems. Over the last four years, a loosely coupled data acquisition and analysis system has been written for use at this facility. This system will be described in detail with particular emphasis on development of high data rate capabilities.

49721 **(UCID—19839) Measurements of the emittance and current density profile of the beam produced by the ATA injector.** Fessenden, T.J. (Lawrence Livermore National Lab., CA (USA)). 27 Jun 1983. Contract W-7405-ENG-48. 18p. NTIS, PC A02/MF A01. Order Number DE83016522.

Measurements of the normalized emittance of the beam produced by the Advanced Test Accelerator (ATA) injector yielded values near 0.4 Radian-Centimeters at currents up to 10 kAmps. The instrument was also used to obtain beam-current-density profiles in two dimensions at the entrance mask of the instrument.

49722 **Optically pumped ^6Li target for PNC studies.** Pappas, P.G. (Massachusetts Inst. of Tech., Cambridge); Murnick, D.E.; Gershenfeld, N.; Niv, Y. *Nuclear Science Research Conference Series;* 3: 395-401(1982). (CONF-820428—).

From Conference on lasers in nuclear physics; Oak Ridge, TN, USA (21 Apr 1982).

Using velocity changing collisions to achieve full Doppler coverage and laser optical pumping we have produced ^6Li vapors with densities greater than $10^{14}/cm^2$ with nuclear polarizations approaching 100%. This polarized vapor can be used as a target to study parity non-conservation in the reaction $^6Li(\alpha, \gamma)\ ^{10}B$.

49723 **(KFK-tr—677) Beam buncher with sinoidal modulation for the axial injection system of the isochronous cyclotron U-240.** Val'kov, A.E.; Linev, A.F. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.)). 1980. Translation source information not available . 17p. (In German). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780868.

Preprint KIYI—80-12, 1980, 17 p.

Use of buncher in the external injection system of the isochronous cyclotron is intended to enlarge the luminosity, which is especially important during acceleration of very low-current beams of the polarized and multicharged ions. Problems of two-gap particle bunching with sinusoidal modulation are considered. An optimal

buncher arrangement, allowing for the energy spread in the source beam, is determined. Calculation of buncher parameters is done for the axial injection system of the isochronous cyclotron U-240. The buncher application allows one to obtain compact bunches and enlarge the source efficiency by 50%.

4304 Storage Rings

REFER ALSO TO CITATION(S) 49656, 49713, 49714, 49750, 50174

49724 (BNL—33416) Nonlinear chromatic effects in the beta function. Parzen, G. (Brookhaven National Lab., Upton, NY (USA)). 1983. Contract AC02-76CH00016. 4p. (CONF-830822—4). NTIS, PC A02/MF A01. Order Number DE83016321.

From 12. international conference on high energy accelerators; Batavia, IL, USA (11 Aug 1983).

A theory is presented for computing the nonlinear dependence of the β-functions on momentum. Results are found for the quadratic term. The results of the theory are compared with computed results. A procedure is proposed for computing the strengths of the sextupole correctors to correct the dependence of the β-function on momentum.

49725 (CAPE—2850) System interrupt module (Engineering Materials). (Stanford Linear Accelerator Center, CA (USA)). 25 May 1981. Contract AC03-76SF00515. USDOE-TIC, PO Bx 62, Oak Ridge, TN 37830.

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The drawings listed on the drawing list provide the data and specifications for constructing a system interrupt module as used on the SLAC SPEAR Storage Ring. This assembly is one of many electronic devices used. It provides a pulse or pulse train with programmable spacing between pulses. The module is used as a ramping synchronizer when ramping from one energy to a higher energy of the counter rotating particles and anti-particles.

49726 (CAPE—2854) Serial input/output processor (SIOP) (Engineering Materials). (Stanford Linear Accelerator Center, CA (USA)). Aug 1978. Contract AC03-76SF00515. USDOE-TIC, PO Bx 62, Oak Ridge, TN 37830.

Portions are illegible in microfiche products6 35-mm aperture cards.

The drawings listed on the drawing list and those listed here provide the data and specifications for constructing a Serial Input/Output Processor unit. This is an electronic device which scans or polls an array of switches on a switch panel and composes a new image of the array and detects whether the new image of the array is different from the previous scan. If there is a difference in the new image, the changes are flagged and a computer is notified. The computer reads this data and then takes the appropriate action. This device and the switch panel arrays were used for control and display prior to the generated display allowing control of many devices by touching a certain spot on a cathode ray tubes face with the appropriate overlay to give matrix type signals to the computer. The three additional drawings listed are for the construction of the SIOP 2 which is an improved model.

49727 (CAPE—2855) Remote interrupt module (Engineering Materials). (Stanford Linear Accelerator Center, CA (USA)). 9 Mar 1981. Contract AC03-76SF00515. USDOE-TIC, PO Bx 62, Oak Ridge, TN 37830.

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The drawings listed on the drawing list provide the data and specifications for constructing a Remote Interrupt Module as used on the SLAC SPEAR Storage Ring. This assembly is used as a slave to a system interrupt module and provides a remote function for the system interrupt module. Together they produce a pulse or pulse train with programmable pulse spacing. This system is used for a ramping synchronization system when a circulating beam or beams are ramped from one energy to another higher energy.

49728 (CAPE—2856) Weldment - drift tube, electric quad to Q2 (Engineering Materials). (Stanford Linear Accelerator Center, CA (USA)). 1 Mar 1972. Contract AC03-76SF00515. USDOE-TIC, PO Bx 62, Oak Ridge, TN 37830.

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The sub-assembly drawing and the drawings referenced thereon provide the data and specifications for constructing a drift tube between the Electric Quadrupole and the Quadrupole 2 as used on the SLAC SPEAR storage ring. This assembly is somewhat typical of interconnecting beam between elements of the storage ring.

49729 (CAPE—2857) SPEAR radiation mask section 8S9 (Engineering Materials). (Stanford Linear Accelerator Center, CA (USA)). 21 Mar 1983. Contract AC03-76SF00515. USDOE-TIC, PO Bx 62, Oak Ridge, TN 37830.

9 35-mm aperture cards.

The sub-assembly drawing and the referenced drawings thereon provide the data and specifications for constructing a typical synchrotron radiation mask as used in the SLAC SPEAR Storage Ring. This mask is slightly different from others in the ring but is used for the same reason. The mask absorbs the synchrotron radiation produced by a curving charged particle to prevent the radiation from striking sensitive instruments, devices, or other parts of the vacuum beam pipe where damage or other ill effects would occur. Curved portions of the beam pipe have water cooling ducts in the outer periphery to absorb the radiation and carry away the generated heat. The dummy mask is used in positions where water cooling is not required but may be used at a later date under other operating conditions. it fits on the standard beam pipe fitting.

49730 (CAPE—2858) SLAC SPEAR drift tube - Kicker Magnet Straight Section 2S3 (Engineering Materials). (Stanford Linear Accelerator Center, CA (USA)). 27 Mar 1974. Contract AC03-76SF00515. USDOE-TIC, PO Bx 62, Oak Ridge, TN 37830.

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The drawings listed and referenced thereon provide the data and specifications for constructing the Kicker Magnet Straight Section of beam pipe located in the kicker magnet. The kicker magnet is used to perturb the beam orbit so that additional electrons or positrons can be injected into the SLAC SPEAR Storage Ring and subsequently join other electrons or positrons already in the circulating beams.

49731 (CAPE—2859) SLAC SPEAR excitation chamber S-10S11 (Engineering Materials). (Stanford Linear Accelerator Center, CA (USA)). 11 Nov 1981. Contract AC03-76SF00515. USDOE-TIC, PO Bx 62, Oak Ridge, TN 37830.

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The drawings listed on the Final Assembly and the auxiliary drawing list provide the data and specifications for constructing an excitation chamber for the SLAC SPEAR Storage Ring. This chamber is used to impress on the circulating beam a high frequency component in order to detect and to provide the tone of the ring. The chamber is provided with electrodes that when properly driven will add the desired frequency to the beam.

49732 (FERMILAB-Conf—82/55-THY) Thousand TeV in the center of mass: introduction to high-energy storage rings. Bjorken, J.D. (Fermi National Accelerator Lab., Batavia, IL (USA)). Sep 1982. Contract AC02-76CH03000. 39p. (CONF-8206212—1). NTIS, PC A03/MF A01. Order Number DE83015649.

From NATO Advanced Study Institute conference; Lake George, NY, USA (1 Jun 1982).

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The lecture discusses, in a pedagogic way, a hypothetical 500 TeV proton storage ring accelerator. It gives machine parameters, discusses linear optics and betatron motions, surveys questions of errors, tolerances and nonlinear resonances, and discusses some of the demands on the detection apparatus, especially the apparent inevitability of multiple interactions per bunch crossing. (GHT)

49733 (INIS-mf—8157, pp 312) **Status of the CERN LEP project.** Plass, G. (European Organization for Nuclear Research, Geneva (Switzerland)). 1982. NTIS (US Sales Only), PC A15/MF A01. (CONF-820675—Vol.2).

From International conference on neutrino physics; Balaton, Hungary (14 Jun 1982).

The present status of the European Large Electron-Positron Storage Ring (LEP) under design and construction is reported. The technical parameters, size, site and instrumentation are summarized. The planned physical and optical beam parameters, like energy, luminosity, purity are described. Some modifications performed during the design period are discussed. The expected time table of construction and operational start of the LEP is outlined.

49734 (INIS-mf—8157, pp 312) **IHEP accelerating-storage complex.** Soloviev, L.D.; Yarba, V.A. (AN SSSR, Moscow). 1982. NTIS (US Sales Only), PC A15/MF A01. (CONF-820675—Vol.2).

From International conference on neutrino physics; Balaton, Hungary (14 Jun 1982).

44 INSTRUMENTATION

4401 Radiation Instrumentation

REFER ALSO TO CITATION(S) 49072, 49720, 50155, 50264, 50266, 50280, 50309

49735 **(BNL—33450) Thermoluminescence systems with two or more glow peaks described by anomalous kinetic parameters.** Levy, P.W. (Brookhaven National Lab., Upton, NY (USA)). 1983. Contract AC02-76CH00016. 26p. (CONF-830573—6). NTIS, PC A03/MF A01. Order Number DE83016723.

From 2. international conference on radiation effects in insulators; Albuquerque, NM, USA (30 May 1983).

The usual first and second order TL kinetic expressions are based on a number of assumptions, including the usually unstated assumption that charges released from one type of trap, giving rise to one glow peak, are not retrapped on other types of traps, associated with other glow peaks. Equations have been developed describing TL systems in which charges released from one type of trap may be retrapped in other types of traps. Called interactive kinetic equations, they are quite simple but have been studied by numerical methods. In particular, glow curves computed from the interactive kinetic equations have been regarded as data and analyzed by fitting them to the usual first and second order kinetic expressions. All of the anomalous features described above are reproduced. For example, usually the computed glow peaks are well fitted by the first and second order expressions over their upper 60 to 80% but not in the wings. This explains why the usual analysis methods, especially those utilizing peak temperature, full width, etc. appear to describe such peaks. Often unrealistic kinetic parameters are often obtained. Furthermore, the computed glow curves often reproduce the observed dependence on dose.

49736 **(CAPE—2851) SLAC Shamar 2 SHAM tester module (Engineering Materials).** (Stanford Linear Accelerator Center, CA (USA)). 10 Apr 1980. Contract AC03-76SF00515. USDOE-TIC, PO Bx 62, Oak Ridge, TN 37830.

Microfiche only, copy does not permit paper copy reproduction1 35-mm aperture cards.

The drawings listed on the drawing list provide the data and specifications for constructing the Shamar 2 SHAM Tester Module. This module is a device which provides the necessary logic and input signals to checkout a SHAM (Sample and Hold Analog Module) with a computer and a Camac controller, either manually or computer sequenced. This assembly is used at SLAC in conjunction with proportional wire chambers or with fast pulse photo multiplier arrays as found on several large experimental detectors.

49737 **(CAPE—2852) SLAC 32 channel TAC module (Engineering Materials).** (Stanford Linear Accelerator Center, CA (USA)). 9 Aug 1978. Contract AC03-76SF00515. USDOE-TIC, PO Bx 62, Oak Ridge, TN 37830.

Portions are illegible in microfiche products1 35-mm aperture cards.

The drawings listed on the drawing list provide the data and specifications for constructing a SLAC 32 Channel TAC (Time to Analog Converter) Module. The device consists of a 5 layer single width CAMAC module used in large scale drift chamber experiments for pulse height readout. The system is based upon 32 channels of sample and hold utilizing the START-COMMON STOP method of operation together with an analog multiplexor. It also employs a 32 channel parallel in-serial out shift register to record the individual hit channel information which in turn is used to test the secondary trigger decision logic. The device was used on the SLAC SPEAR MARK III detector.

49738 **(CAPE—2853) SLAC LORA MUX tester module (Engineering Materials).** (Stanford Linear Accelerator Center, CA (USA)). 22 Dec 1981. Contract AC03-76SF00515. USDOE-TIC, PO Bx 62, Oak Ridge, TN 37830.

Paper copy only, copy does not permit microfiche production4 35-mm aperture cards.

The drawings listed on the drawing list provide the data and specifications for constructing a SLAC LORA MUX tester. This device is designed to check the multiplexor (Hi-506A) chip in the TAC module (see DL 135-429-00-RO 32 Channel TAC Module) part of the 32 Channel TAC and the Sample and Hold Module (SHAM 2). The module replaces the CAMAC CRATE controller during the time it is enabled by an external trigger, thus generating a series of addresses together with function pulses to the TAC or SHAM multiplexors. This device was used with experiments using the MARK II Detector on the SLAC SPEAR Storage Ring.

49739 **(CONF-830927—2) Crystal growth and applications of mercuric iodide. Report S-242-TP.** Schieber, M.; Roth, M.; Schnepple, W.F. (Hebrew Univ., Jerusalem (Israel). School of Applied Science and Technology; EG and G, Inc., Goleta, CA (USA)). 1983. Contract AC08-83NV10282. 4p. NTIS, PC A02/MF A01. Order Number DE83016731.

From 7. international conference on crystal growth; Stuttgart, F.R. Germany (12 Sep 1983).

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A brief summary is given of a paper which discusses the crystal growth of mercuric iodide, a high-Z wide bandgap semiconductor suitable as a low noise, room temperature x-ray and gamma-ray detector. The paper summarized also reviews the state-of-the-art of the synthesis and purification of the starting material, mechanical properties and dislocation structure of HgI_2, and recent success in the development of thick HgI_2 spectrometers. (LEW)

49740 **(DOE/ER/40033—46) Performance of a high-pressure hydrogen TPC.** Chapin, T.J.; Cool, R.L.; Goulianos, K.; Jenkins, K.A.; Silverman, J.P.; Snow, G.R.; Sticker, H.; White, S.N.; Chou, Y.H. (Rockefeller Univ., New York (USA); Academia Sinica, Beijing (China). Inst. of High Energy Physics). Jun 1983. Contract AC02-81ER40033. 19p. (CONF-8306110—1). NTIS, PC A02/MF A01. Order Number DE83016556.

From 2. Pisa meeting on advanced detectors; Castiglione della Pescaia, Italy (2 Jun 1983).

We report on the performance of a high-pressure hydrogen-filled time-projection chamber (TPC) designed to study photon-diffraction dissociation on hydrogen. The TPC consists of two identical 75-cm-long by 45-cm-diameter drift regions filled with H_2 at 15 atm. It is used as an active target to measure the polar angles and dE/dx of recoil protons.

49741 (EGG-M—03683) **Variation of Ge detector efficiency with source diameter and radial source position.** Helmer, R.G. (EG and G Idaho, Inc., Idaho Falls (USA)). 1983. Contract AC07-76ID01570. 5p. (CONF-830585—2). NTIS, PC A02/MF A01. Order Number DE83015900.

From International committee for radionuclide seminar on applied radionuclide metrology; Gell, Belgium (16 May 1983).

For two Ge detectors, the γ-ray efficiency obtained with a disk source was determined relative to that for a point source. These ratios were measured by two methods and calculated by a third method and are compared.

49742 (IA—1375, pp 249) **Fabrication of stepped foil targets.** Gilath, I.; Sapir, Y. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49743 (IA—1375, pp 235-237) **Experimental evaluation of photoneutron doses from a 16 MeV X-ray medical linear accelerator using nuclear track etch detectors.** Schlesinger, T.; Ovadia, E.; Faermann, S.; Eisen, Y. (Israel Atomic Energy Commission, Tel Aviv); Werner, A.; Zhigun, L. (Sheba Medical Center, Tel Hashomer (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49744 (IA—1375, pp 237-238) **Heavy duty radiation detector for use in a nuclear level-gauge operating in the mining industry under severe conditions.** Pasi, M.; Assido, C.; Shemesh, Y.; Glizer, H.; On, I.; Gabay, Y. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49745 (IA—1375, pp 240) **Through-hole ionization chamber.** Abrashkin, S. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49746 (IA—1375, pp 240) **Direct-reading reference-time activity calibration system.** Abrashkin, S. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49747 (IA—1375, pp 254) **Computerized spectrum multiscale analyzer.** Szichman, H. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49748 (INIS-mf—8136) **Alumina as a thermoluminescent material for personnel dosimetry.** Beinsteiner, J. (Innsbruck Univ. (Austria). Inst. fuer Radiochemie und Angewandte Physikalische Chemie). Jun 1980. 146p. (In German). NTIS (US Sales Only), PC A07/MF A01. Order Number DE83702813.

Thesis.

In this paper the possible use of aluminium for dosimeters is investigated. The thermoluminescence recovery should be enhanced by different forms of doping and the form of the dosimeter should give reproductable results. Doping was done by coprecipitation of the additive with an Al salt from aqueous solutions and then converting to the oxides by heating. Doping with 850 ppm Tb_2O_3 gives a 50 fold enhancement of the sensitivity. The emission of light is in the blue range. The use of PTFE for matrix material is strongly restricted because PTFE absorbes too much of the blue light. Sintering in vacuum or in hydrogen converts Tb_4O_7 into Tb_2O_3 and the reaction Tb(III)-radiation, heat-Tb(II) activates the luminescence. Tablets of these material produced by sintering in hydrogen with peaks at 125 and 72°C are 13 times as sensitive as LiF (TLD-100) and are linear in the range till 5000R. Fading in one month is 20% but loss of information is 13% after the first day. An apparatus was built which allows a semiautomatical evaluation of 50 dosimeters.

49749 (INIS-mf—8156, pp 412) **Advances in the deep underwater muon and neutrino experiment on the Lake Baikal.** 1982. NTIS (US Sales Only), PC A19/MF A01. (CONF-820675—Vol.1).

From International conference on neutrino physics; Balaton, Hungary (14 Jun 1982).

9 refs.; Moscow-Irkutsk-Tomsk Collaboration.

Present status of work on deep underwater detection of muons and neutrinos on the Lake Baikal is reported. Preliminary results of site studies and apparatus tests are discussed.

49750 (INIS-mf—8157, pp 312) **Proposed high intensity national neutrino facility at LAMPF.** Agnew, L.E.; Bowles, T.J.; Burman, R. (Los Alamos National Lab., NM (USA)). 1982. NTIS (US Sales Only), PC A15/MF A01. (CONF-820675—Vol.2).

From International conference on neutrino physics; Balaton, Hungary (14 Jun 1982).

A proposal for a high intensity national neutrino facility which will make use of the low duty factor intense beam from the Proton Storage Ring at LAMPF is described. Intense high purity beams of νsub(μ) and anti νsub(μ) from pion decay in flight as well as beams of νsub(μ),anti νsub(μ), and νsub(e) from a beam stop will be provided. A broad range of experiments in neutrino physics in both nuclear and particle physics can be performed at this facility.

49751 (INIS-mf—8157, pp vp) **New trends in detector construction.** Kleinknecht, K. (Dortmund Univ. (Germany, F.R.). Inst. fuer Physik). 1982. NTIS (US Sales Only), PC A15/MF A01. (CONF-820675—Vol.2).

From International conference on neutrino physics; Balaton, Hungary (14 Jun 1982).

49752 (INIS-mf—8157, pp vp) **Neutrino and proton decay detector with streamer or Geiger plastic tubes.** Iarocci, E. (Istituto Nazionale di Fisica Nucleare, Frascati (Italy). Lab. Nazionale di Frascati). 1982. NTIS (US Sales Only), PC A15/MF A01. (CONF-820675—Vol.2).

From International conference on neutrino physics; Balaton, Hungary (14 Jun 1982).

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The use of plastic streamer tubes, with both digital and charge readout, is discussed in connection with digital tracking calorimeters for neutrino detectors. A new version of plastic tubes, based on limited Geiger operation and Geiger propagation time measurement, is described and its possible application for p-decay and low energy neutrino detector is discussed.

49753 (INIS-mf—8157, pp vp) **New neutrino detector for the Serpukhov accelerator.** 1982. NTIS (US Sales Only), PC A15/MF A01. (CONF-820675—Vol.2).

From International conference on neutrino physics; Balaton, Hungary (14 Jun 1982).

Microfiche only, copy does not permit paper copy reproduction. Original copy available until stock is exhausted refs.; Berlin-Budapest-Dubna-Serpukhov Collaboration.

Design and performance of a fine-grained neutrino detector is described. It will come into operation at the Serpukhov accelerator to study anti νsub(μ)e and anti νsub(μ)p elastic scattering in a wide band beam and to measure inclusive reactions in a dichromatic and in an anti νsub(e) enriched beam. This detector will also provide information on prompt neutrino production and on anti νsub(μ)→anti νsub(e) oscillation.

49754 (INIS-SU—136, pp 36-46) **SKAT bubble chamber. Casing and the main design elements.** Astakhov, A.V.; Bol'shakov, V.A.; Vaulina, I.G. 1981. (In Russian). NTIS (US Sales Only), PC A06/MF A01.

Paper copy only, copy does not permit microfiche production. Original copy available until stock is exhausted refs.; 9 figs.

In Electrophysical apparatus. Issue 18. Collection of articles.

The design of the SKAT bubble chamber and test results of the chamber casing are described. The longitudinal size of the chamber equals 4.5 m, the transverse ones is 1.6x0.95 m. The working volume of the chamber is separated from the photodetecting system by the 2.5 m water layer. Water brought into the safe

volume is separated from the working liquid by glass of 4220x1300 dimensions and 144 mm thickness. A set of valves of the expansion system is the back wall of the chamber. Vertical position of the glass is adopted in the design. The mass of the working volume makes up 27t, the mass of the set of valves equals 45t, the mass of the casing with the glass is 4.5t. Test results of the chamber casing have shown that bend stresses are the prevailing ones in the casing at 38 atm pressure. The value of stress in the conic part of the casing of the safe volume constituted about 500 kg/cm^2. The maximum stress in the casing of the working volume with support on the magnet joke does not exceed 1300 kg/cm^2. A conclusion on correctness of the design developed is made on the base of calculations and model investigations of the sressed state of the casing model.

49755 (JAERI-M—82-033) Manual of CTA dose meter. Tanaka, R.; Mitomo, S.; Sunaga, H.; Tamura, N.; Matsuda, K. (Japan Atomic Energy Research Inst., Tokyo). Apr 1982. 35p. (In Japanese). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702435.

A dosimetry manual is presented for practical use of CTA (cellulose triacetate) dose meter for high level electron and gamma-ray dosimetry. The reading of CTA dose meter has linear response to dose, and the effective measuring range is one to fifteen Mrad. The dose response does not depend on dose rate, temperature and humidity under usual irradiation conditions with electron beams, whereas it depends on temperature and humidity under usual irradiation conditions with γ-rays. Since CTA dose meter is availabel in a form of film strip, the measurement can be done either on separate short pieces of film from point to point or on a piece of long strip to obtain a dose distribution curve directly. The CTA dose meter in a form of film stack can be used for measurement of depth dose distribution. The present manual describes properties of CTA dose meter, an instrument for optical absorbance measurement, standard procedures for dose measurement using film pieces or long film strip, method of conversion from optical absorption to dose, accuracy of dose measurement, and a few examples of practical applications.

49756 (JAERI-M—9982) Neutron dosimetry based on the spectrum weighting function method using a NE213 scintillation detector. Oyama, Y.; Tanaka, S. (Japan Atomic Energy Research Inst., Tokyo). Mar 1982. 25p. (In Japanese). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83701467.

A method was developed to measure the neutron dose with a high sensitivity based on the spectrum weighting method using a 50.8 mm diam. by 50.8 mm thick NE213 liquid scintillation detector. The present method is to derive directly a neutron dose from the pulse height distribution of the NE213 detector utilizing a spectrum weighting function. Hence a calculational code: GFUNC was written to obtain the spectrum weighting function for the NE213 detector from the response matrix for neutrons and from the flux-to-dose conversion factor. In order to investigate the accuracy and the sensitivity of the neutron dose measurements due to the present method, the neutron doses yielded from Am-Be and ^{253}Cf neutron sources were compared with those calculated using the spectrum which was measured by the unfolding method using the same NE213 detector. Consequently it was made apparent that the discrepancy between this method and the unfolding method is lower than 7% and the sensitivity is 0.24 mrem/hr/cps to the neutrons originated from the Am-Be source.

49757 (JINR—R-1-82-40) Electron streamer tracks in neon under pressure. Volodin, V.D.; Glagoleva, N.S.; Dement'ev, E.A.; Kuznetsov, A.A.; Matyushevskij, E.A.; Matyushin, A.T.; Matyushin, V.T. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy). 1982. 8p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702335.

Experimental results of a study on the dependence of streamer dimensions in neon on pressure are described. These are obtained by means of photographs of electron tracks from the beta-source in a streamer chamber permitting a smooth variation of operating gap from 0 up to 100 mm within the 0-1 MPa pressure range. A bipolar generator was used as a power supply. The charging voltage of the generator is equal to +- 54 kV, pulse duration constituted 18 ns. The pulses coming from cables matched with 50 Ω resistors at the end go with the chamber electrodes. Photographs were taken by means of the four RFK-5 cameras operating in synchronous mode. The camera resolution is equal to 0.15 mm. It is found that at pressure variation from 0.06 to 1 MPa b approximately Psup(-0.58+-0.02), lsub(c) approximately Psup(-0.58+-0.06), dsub(c)approximately Psup(-0.58+-U.01) where b equals the intraelectrode gap, lsub(c), = streamer mean length, and dsub(c) = mean diameter.

49758 (JINR-R—3-81-828) Correlation type time-of-flight spectrometer for ultracold neutrons. Novopol'tsev, M.I.; Pokotilovskij, Yu.N. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Neutron Physics). 1981. 10p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83701469.

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Correlation type time-of-flight spectrometer for ultracold neutrons is described. The spectrometer involves pseudostatistical chopper (0.2 mm thickness), horizontal neutronguide and detector with goffred rotating scintillator. Data accumulation and handling is performed by autonomous microprocessor system. The results on the measuring neutron spectra from neutronguides are given, transmission of ultracold neutrons through the interference filters is measured. The energy resolution is about 3 neV for 100 neV neutrons. The influence of the chopper instability and imperfectness upon resolution function is numerically processed.

49759 (JINR-R—13-82-48) Measurement of particle track coordinates according to the centre of gravity of light flash in a scintillator. Barabash, L.S.; Komogorova, L.V.; Lustov, N.M.; Mal'tsev, Eh.I.; Petukhov, Yu.P.; Fedunov, A.G.; Kharin, A.M.; Chalyshev, V.V.; Chirikov-Zorin, I.E. (Joint Inst. for Nuclear Research, Dubna (USSR). Dept. of New Acceleration Methods). 1982. 4p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83701468.

Paper copy only, copy does not permit microfiche production refs.; 4 figs.; submitted to the journal Nucl. Instrum. Methods.

Results of studies of a position-sensitive scintillation counter are presented. The coordinates of tracks in the counter have been calculated by the centre of gravity of light flash in the scintillator. The light flash distribution has been measured by a system of strip lightguides. The accuracy in measuring the track coordinates of electrons from a ^{106}Ru radioactive source is 3.0 mm. When the tracks are imitated by a collimated light diode (the slit width is 0.8 mm), the accuracy in determining the coordinate light source is 1.27 mm. Studies are presented in the form of the light flash in the scintillator from the ^{106}Ru particles, the collimated light diode and cosmic rays. The intensity distributions from light diode and cosmic rays are well coincide in shape, but distribution width from the radiation source is slightly more.

49760 (MESA-IR—1005) Calibration procedures for radon and radon-daughter measurement equipment. Beckman, R.T. (Mining Enforcement and Safety Administration, Denver, CO (USA). Denver Technical Support Center). 1975. 50p. NTIS, PC A03/MF A01. Order Number DE83902976.

This Mining Enforcement and Safety Administration publication describes the apparatus and procedures necessary to calibrate the various types of equipment used for radon and radon-daughter measurement. The publication describes air-sampling devices, counting instruments, and other specialized equipment for measuring radon gas and both attached and unattached radon daughters. The use of these standardized calibration procedures is necessary for accurate, uniform measurement of radon and radon-daughter concentrations.

49761 **(PINSTECH/HP—24) Gamma spectrometric analyses of environmental samples at PINSTECH.** Faruq, M.U.; Parveen, N.; Ahmed, B.; Aziz, A. (Pakistan Inst. of Nuclear Science and Technology, Rawalpindi. Health Physics Div.). 1979. 15p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702320.

Gamma spectrometric analyses of air and other environmental samples from PINSTECH were carried out. Air particulate samples were analyzed by a Ge(Li) detector on a computer-based multichannel analyzer. Other environmental samples were analyzed by a Na(T1) scintillation detector spectrometer and a multichannel analyzer with manual analysis. Concentration of radionuclides in the media was determined and the sources of their production were identified. Age of the fall out was estimated from the ratios of the fission products.

49762 **(PINSTECH/HP—27) Environmental levels of gamma emitting radionuclides at PINSTECH. Period 1979-1980.** Faruq, U.; Parveen, N.; Aziz, A. (Pakistan Inst. of Nuclear Science and Technology, Rawalpindi. Health Physics Div.). 1981. 22p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702321.

Sampling and gamma spectrometric analysis of air-borne particulates and various items of food were carried out at PINSTECH. Air-particulates were analyzed on a computer-based high resolution Ge(Li) detector gamma spectrometer. Food samples were analyzed by a NaI(TI) scintillation detector gamma spectrometer without computer analysis. Data on the levels of the concentration of gamma emitting radionuclides in environmental media at PINSTECH during 1979-80 is given and discussed.

49763 **(RL—82-069) RMS program system and database.** Fisher, S.M.; Peach, K.J. (Science Research Council, Chilton (UK). Rutherford and Appleton Labs.). Aug 1982. 23p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702422.

This report describes the program system developed for the data reduction and analysis of data obtained with the Rutherford Multiparticle Spectrometer (RMS), with particular emphasis on the utility of a well structured central data-base.

49764 **(SLAC-PUB—3037) Dimethylether: a low velocity, low diffusion drift chamber gas.** Villa, F. (Stanford Linear Accelerator Center, CA (USA)). Jan 1983. Contract AC03-76SF00515. 7p. (CONF-830223—7). NTIS, PC A02/MF A01. Order Number DE83016679.

From Wire chamber conference; Vienna, Austria (15 Feb 1983).

There are two main motivations to look for a low electron mobility gas: the first is that a low drift velocity relaxes the need to measure drift times with nanosecond (or even subnanosecond) precision; the second is that (in an ideal drift geometry), the capability of resolving two closely spaced tracks depends upon the ratio of electron mobility to ion mobility μ/sub e//μ/sub i/. Since μ/sub i/ is rather constant, the way to separate two tracks is to slow down the electrons. Many other properties are required besides low mobility and low drifting electron temperature: the gas should have a large ($> 10^3$) stable gain; it must be chemically stable and not oxic; it should not attack materials commonly used to fabricate drift chambers, etc. With these requirements in mind, we have tried a few promising (on paper) gases, either pure or in admixture with Argon. One of the gases examined, dimethylether [$(CH_3)_3$)], has shown interesting characteristics.

49765 **(SLAC-PUB—3108) Status and future plans for the Mark II detector at SLAC.** Perl, M.L. (Stanford Linear Accelerator Center, CA (USA)). Apr 1983. Contract AC03-76SF00515;AC03-76SF00098. 7p. (CONF-830231—5). NTIS, PC A02/MF A01. Order Number DE83016590.

From Europhysics study conference on electroweak effects at high energies; Erice, Italy (1 Feb 1983).

In this brief talk, I report on three subjects. First the present status of PEP, where there has been a very large increase in the luminosity in the past five months. Next, the present status of the Mark II detector, whose secondary vertex detector constitutes a very important part of the physics which our collaboration is doing at PEP. Finally, I review the design of the upgraded Mark II Detector which will be used at the Stanford Linear Collider (SLC).

49766 **(SSI-A—82-21) Reliability of the systems of personal dosimetry. An investigation of the systems of personal dosimetry in Sweden.** Gullberg, O.; Lindborg, L. (Statens Straalskyddsinstitut, Stockholm (Sweden)). 17 Nov 1982. 28p. (In Swedish). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702322.

The dosimeters of companies and institutions have been irradiated at various energy and dose equivalent levels. Systematic and coincident errors in measurement are presented. The results show that relatively large systematic errors can be made by both the thermoluminescent and film systems. Various techniques to judging the quality of the dosimetry are discussed.

49767 **(SSI-K—82-03) Release of activity - occupational exposures of the nuclear power industry. Second quarter 1982.** (Statens Straalskyddsinstitut, Stockholm (Sweden)). 1982. 14p. (In Swedish). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702323.

A compilation of the emissions from nuclear power plants is presented for the period April to June 1982. The emissions are given as collective dose equivalent index. Personnel dosimetry is assorted.

49768 **A simple multifunction discriminator for multichannel triggers.** Maier, M.R. (Nuclear Science Division Lawrence Berkeley Laboratory, University of California, Berkeley, CA 94720). *IEEE (Institute of Electrical and Electronics Engineers) Transactions on Nuclear Science;* **30**: No. 1, 335-338(Feb 1983). Contract AC03-76SF00098.

A simple version of a multifunction timing discriminator using only two integrated circuits is presented. It can be configured as a leading edge, a constant fraction, a zero cross or a dual threshold timing discriminator. Since so few parts are used, it is well suited for building multichannel timing discriminators. Two versions of this circuit are described: a quadruple multifunction discriminator and an octal constant fraction trigger. The different compromises made in these units are discussed. Results for walk and jitter obtained with these are presented and possible improvements are discussed.

49769 **A fast multichannel analog storage system.** Freytag, D.R. (Stanford Linear Accelerator Center, Stanford University, Stanford, CA 94305). *IEEE (Institute of Electrical and Electronics Engineers) Transactions on Nuclear Science;* **30**: No. 1, 339-341(Feb 1983). Contract AC03-76SF00515.

A Multichannel Analog Storage System based on a commercial 32-channel parallel in/serial out (PISO) analog shift register is described. The basic unit is a single width CAMAC module containing 512 analog cells and the associated logic for data storage and subsequent readout. At sampling rates of up to 30 MHz the signals are strobed directly into the PISO. At higher rates signals are strobed into a fast presampling stage and subsequently transferred in block form into an array of PISO's. Sampling rates of 300 MHz have been achieved with the present device and 1000 MHz are possible with improved signal drivers. The system is well suited for simultaneous handling of many signal channels with moderate numbers of samples in each channel. RMS noise over full scale signal has been measured as 1:3000 ($\approx$11 bit). However, nonlinearities in the response and differences in sensitivity of the analog cells require an elaborate calibration system in order to realize 11 bit accuracy for the analog information.

49770 **Large signal production in wire chambers filled with noble gas-carbon dioxide and noble gas hydrocarbon mixtures.** Mulera, T.; Guerra, A.D.; Perez-Mendez, V.; Schwartz, G. (Lawrence Berkeley Laboratory, Berkeley, CA 94720). *IEEE (Institute of Electrical and Electronics Engineers) Transactions on Nuclear Science;* **30**: No. 1, 355-357(Feb 1983). Contract AC03-76SF00098.

Large, saturated, fast pulses of the type referred to as "self quenching streamer" have been observed in thick anode wire cham-

bers filled with a variety of highly quenching gas mixtures. This mode of operation has been studied as a function of voltage, gas mixture and pressure, and chamber geometry.

49771 **A novel radiation detector consisting of an H / SUB g/ I_2 photo detector coupled to a scintillator.** Iwanczyk, J.S.; Barton, J.B.; Dabrowski, A.J.; Kusmiss, J.H.; Szymczyk, W.M. (University of Southern California, Institute for Physics and Imaging Science, 4676 Admiralty Way, Suite 932 Marina del Rey, CA 90291). *IEEE (Institute of Electrical and Electronics Engineers) Transactions on Nuclear Science;* **30**: No. 1, 363-367(Feb 1983). Contract AM03-76SF00113.

HgI_2 photodetectors have been used in conjunction with CsI(T1) and BGO to detect the light pulses from gamma rays and alpha particles. The photocurrent response to light of a typical H / SUB g/ I_2 photodetector is presented and discussed. The spectral response is appropriate for most important scintillators, which have their maximum emission between 400 and 560 nm. Energy spectra obtained with an HgI_2 photodetector coupled to a CsI(T1) scintillator crystal are presented for gamma rays from ^{137}Cs, a ^{68}Ga positron source, ^{241}Am, and /SUP 99m/ Tc, as well as for the K x-rays from Pb. The photopeak energy resolution value for 511 keV annihilation gamma rays with the CsI(T1)-HgI_2 combination was about 10%. Spectra obtained with an HgI_2 photodetector coupled to a BGO scintillator crystal are presented for the annihilation gamma rays from a ^{68}Ga positron source (19% photopeak resolution) and the alpha particles from a ^{244}Cm source. Estimates of the quantum efficiencies for an HgI_2 photodetector coupled to CsI(T1) and BGO scintillator crystals give values in excess of 70%. A brief discussion is given of the limits on energy resolution set by the electronic noise. Potential applications of this novel radiation detection device and the advantages over photomultiplier-based devices are discussed.

49772 **A versatile secondary trigger for a multi-detector system.** Ouimette, D.; Porat, D.; Tilghman, A.; Young, C. (Stanford Linear Accelerator Center, Department of Physics, Stanford University, Stanford, California 94305). *IEEE (Institute of Electrical and Electronics Engineers) Transactions on Nuclear Science;* **30**: No. 1, 328-330(Feb 1983). Contract AC03-76SF00515.

The electronics of a secondary trigger for particle physics is described. The system has several desirable features that solve track recognition problems in situations where several subsystems of various cell configurations participate in the decision making. Track curvature and multiplicity are the criteria used. Versatility is attained through the use of Programmable Array Logic (PAL) and a 48-bit wide ROM-based sequencer that determines, with the resolution of a cell, the participation of each element in the decision process. Data from layers with arbitrary numbers of cells are shifted in a programmable manner through a PROM mask containing eight different track definitions. The results of any one of the eight triggering criteria are available 5.6 μs after the end of drift interval.

49773 **Instrument evaluation No. 25. Pitman model 37D portable X-ray dosemeter.** Burgess, P.H.; Iles, W.J. Harwell, England; National Radiological Protection Board (1982). 23p. (NRPB-IE—25). HMSO, London, price Pound 2.00.

The Pitman Model 37D is a portable, battery-powered electrometer intended for radiological monitoring. There is an associated range of four nominally air equivalent ionisation chambers of different volume and construction, all of which are vented to the atmosphere. The instrument has an extremely wide dynamic range from 0.03 mR full scale on the most sensitive range with the largest chamber (350 cm^3) to 1000 R on the least sensitive range with the smallest chamber (3.5 cm^3), a range of 3.3 x 10^7. The corresponding figures for exposure rate are 1.8 mR h^{-1} and 6 x 10^4 R h^{-1}. The measured performance characteristics are summarised in tabular form.

49774 **Instrument evaluation No. 26. Graetz X50B dose rate meter.** Burgess, P.H.; McClure, D.R. Harwell, England; National Radiological Protection Board (1982). 16p. (NRPB-IE—26). HMSO, London, price Pound 2.00.

The Graetz X50B is a portable, battery-powered exposure rate meter. It includes: (a) an internal energy compensated detector for use with the exposure rate range from 0.5 mR h^{-1} to 50 R h^{-1} over an energy range of 83 keV to 2 MeV; (b) an optional external detector, type 18529, for use with a separate scale marked 10 R h^{-1} to 500 R h^{-1}; (c) a range of external detectors (of which only the type 18504 was tested) for use with the count rate range from 0.5 counts s^{-1} to 10,000 counts s^{-1}. The equipment is manufactured by Graetz Vertriebsgesellschaft mbH of West Germany and is imported to the UK by Inspection Equipment Ltd, Oaklands Road, London NW2 6DF.

49775 **Novel angle resolved spectrometer for charged particle spectroscopy.** Riley, J.D.; Leckey, R.C. (La Trobe Univ., Bundoora (Australia)). pp 437-440 of Physics for Australia's development. 2nd applied physics conference of the Australian Institute of Physics. Sydney, Australia; Australian Institute of Physics (1981). (CONF-811279—).

From 2. applied physics conference of the Australian Institute of Physics; Melbourne, Australia (1 Dec 1981).

In order to extract the maximum information from any experiment in electron (or ion) spectroscopy, it is necessary to examine the angular dependence of the energy distribution of the emitted particles. It is usual to acquire a set of energy distribution curves for a variety of polar emission angles by means of a moveable energy analyser of narrow acceptance angle. To circumvent the major limitation of this technique (time for sequential measurements), a novel type of electron energy analyser which enables a set of energy distributions to be obtained simultaneously has been designed and constructed. The instrument utilizes toroidal electrodes. With the geometry used there is strong focussing in terms of the emission angle α but little focussing in terms of the polar emission angle theta. The arrival position of an electron on the circular focus is a direct measure of the angle theta.

49776 **Radon and thoron daughter integrating personal dose meter.** Grealy, G.; Peggie, J.; Leach, V.; Solomon, S.; Thomson, J. (Australian Radiation Lab., Melbourne). pp 487-492 of Physics for Australia's development. 2nd applied physics conference of the Australian Institute of Physics. Sydney, Australia; Australian Institute of Physics (1981). (CONF-811279—).

From 2. applied physics conference of the Australian Institute of Physics; Melbourne, Australia (1 Dec 1981).

The design and evaluation of a radon daughter integrating dosimeter are described. Radon daughters deposited on the front of a filter irradiate a TL disc with alpha, beta and gamma radiations. A second TL disc behind the filter is irradiated with beta and gamma radiations from the daughter products. The combination of filter material and air gap prevents the backward travelling alpha particles from arriving at the rear disc. The $CaSO_4$:Dy TL material in teflon disc form together with the filter medium used and the geometry of the filter head assembly was found to have a response which was linear with Working Level litres. Both laboratory calibration and field trials showed the TL response to be 0.06 WL-litres per TL count. The dosemeter has adequate sensitivity for measuring occupational levels of 0.03 WL for radon daughters and 0.09 WL for thoron daughters.

49777 **Dosimetry in nuclear methods used in agricultural research.** Kysela, F. (Ceskoslovenska Akademie Ved, Prague. Ustav Experimentalni Botaniky:. pp vp of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

The application of nuclear methods in agricultural research is not possible without perfect dosimetry of nuclear radiation, i.e., the dosimetry of radioactive samples mostly labelled with beta decay radionuclides in the form of either solid or liquid samples, in the form of radiochromatographic paper bands or chromatograms on thin layers or electrophoretic gels. Dosimetry with double-labelled compounds is also used next to autoradiography and, recently, scanning. Gamma fields play an important role in genetics and breeding and measuring its isodoses was a guide when methods

were used involving ionizing radiations. Personnel dosimetry in laboratories using sources of beta radiation is also important.

49778 **Preparation of plant material for measurement of ^{3}H and ^{14}C activity by liquid scintillation: incineration under oxygen flow.** Kala, A.; Peska, J. (Vysoka Skola Zemedelska, Brno (Czechoslovakia)). pp vp of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

An instrument was developed for the incineration of ^{14}C and ^{3}H labelled plant material. The method is suitable for liquid scintillation counting and allows incineration of 400 mg and 1000 mg of organic matter in one lot for the extimation of ^{14}C and ^{3}H, resp. The lowest specific activity of original material can be 10^{-2} $Bq.mg^{-1}$. The recovery of ^{14}C and ^{3}H was 99.7 and 98.1 per cent, resp. The variation coefficient for reproducibility was lower than 2 per cent. The throughput of the apparatus is 8 samples per hour. Its design is simple and only common chemicals are necessary for its operation.

49779 **Preparation and use of scintillation gel based on dispersion of polyethylene in toluene scintillator.** Kala, A.; Peska, J. (Vysoka Skola Zemedelska, Brno (Czechoslovakia)). pp vp of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

Polyethylene dissolved in a toluene scintillator at 70 to 90°C, produced after cooling, a scintillation gel showing much better handling properties than a gel based on polymethylacrylate. The new gel is comparable with the scintillation gel prepared from the foreign product Cab-O-Sil. It was shown that the gel with 5 to 7 per cent of polyethylene showed a high carrying capacity allowing its wide use for the preparation of powder-like samples when detecting beta activity by liquid scintillation spectrometry. In determining ^{14}C in plant material with activity > 1 Bq/mg^{-1} the variation coefficient of five parallel measurements did not exceed 4 per cent.

49780 **Plant material decolouring for beta detection by liquid scintillation spectrometry.** Kala, A. (Vysoka Skola Zemedelska, Brno (Czechoslovakia)). pp vp of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

Solutions of chloramine T (sodium p-toluenesulfochloramine) or chloramine B (sodium benzenesulfochloramine) in methanol and acetic acid (1:1) were shown to be an effective decolouring agent when preparing green plant material for determination of beta activity by liquid scintillation spectrometry. Both fresh and dry plant material can be bleached directly or after previous maceration using, e.g., Soluene 100. The latter procedure gave more reproducible results when measuring ^{14}C activity in leaves of winter wheat probably due to a better release of ^{14}C-labelled material from plant tissues.

4402 Radiation Effects On Instrument Components, Instruments, Or Electronic Systems

49781 **(LBL—15410) Neutron-transmutation-doped germanium bolometers.** Palaio, N.P.; Rodder, M.; Haller, E.E.; Kreysa, E. (Lawrence Berkeley Lab., CA (USA); Max-Planck-Institut fuer Radioastronomie, Bonn (Germany, F.R.)). Feb 1983. Contract AC03-76SF00098. 13p. (CONF-830235—2). NTIS, PC A02/MF A01. Order Number DE83015993.

From 7. international conference on infrared and millimeter waves; Marseilles, France (14 Feb 1983).

Six slices of ultra-pure germanium were irradiated with thermal neutron fluences between 7.5×10^{16} and 1.88×10^{18} cm^{-3}. After thermal annealing the resistivity was measured down to low temperatures (< 4.2 K) and found to follow the relationship $rho - rho_0 exp(\Delta/T)$ in the hopping conduction regime. Also, several junction FETs were tested for noise performance at room temperature and in an insulating housing in a 4.2K cryostat. These FETs will be used as first stage amplifiers for neutron-transmutation-doped germanium bolometers.

49782 **(SAND—83-0615C) Radiation testing of the CMOS 8085 microprocessor family.** Sexton, F.W.; Anderson, R.E.; Corbett, W.T. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 20p. (CONF-830714—13). NTIS, PC A02/MF A01. Order Number DE83014604.

From 20. IEEE annual conference on nuclear and space radiation effects; Gatlinburg, TN, USA (18 Jul 1983).

Radiation testing of the SA3000 family, CMOS versions of the Intel 8085 microprocessor family, has demonstrated full functionality after 3×10^{6} rad (Si) total dose. Static supply currents measured after reset increased from approximately 50 etaA to 500 μA at V/sub DD/ = 10V while maximum operating frequency decreased from greater than 10 MHz to 4 MHz at V/sub DD/ = 9V post 3×10^{6} rad (Si). Output drive currents decreased 25% post 1×10^{6} rad (Si) and 40% post 3×10^{6} rad (Si). The nominal threshold voltage shift of discrete transistors measured under worst-case bias (n-channels, ON; p-channels, OFF) shifted -0.5 volts and -2.40 volts post 1×10^{6} rad (Si) for n-channel and p-channel MOSFETs, respectively. Transient radiation upset levels of about 1×10^{9} rad (Si)/sec have been measured for parts from this family. Latch-up immunity has been demonstrated up to 1×10^{12} rad (Si)/sec and electrical bench tests are discussed which prove this technology is immune to latch-up. The technology used for the SA3000 family is a 3μm silicon gate process fabricated in n and n+ epitaxial silicon. Functional test programs for each chip of the family are discussed.

49783 **(ANL-Trans—1207) Adapter cone for bite-type fitting pipe joints.** Kreidel, H.; Kreidel, H. Jr. (Argonne National Lab., IL (USA)). Dec 1982. Contract W-31-109-ENG-38. Translation of West German patent 956,554. 6p. NTIS, PC A02/MF A01. Order Number DE83016258.

Portions are illegible in microfiche products.

In order that the bite-type fitting pipe joints can also be installed in connecting bodies which are provided with an inside taper inclined at any angle, it is proposed according to the invention that an adapter cone be inserted whose inside tapered hole has the amount of taper required for the cutting-in of the packing ring and whose outside taper circumference is slightly smaller than the existing inside taper of the connecting piece, whereby the adapter cone has a recess on its free front end near the necessary pipe stop that forms a collar-shaped shoulder whose outer surface forms the extension of the outside taper. This shoulder is flexibly and elastically deformed during creation of the pipe joints by interaction between the pressure piece and the connecting piece to form a local narrow sealing surface with the inside taper of the connecting piece.

4403 Miscellaneous Instruments

REFER ALSO TO CITATION(S) 49057, 49644

49784 (DOE/JPL—1012-81, pp 101-105) **Submicron particle size measurement.** Pettit, D.; Peterson, T. (Univ. of Arizona, Tucson). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

In situ particle number and size analysis for aerosol systems is briefly discussed. Electrical mobility techniques and optical techniques are briefly described. Also, single particle count techniques are explained briefly. Instruments used and compromises within different systems are mentioned. (LEW)

49785 (DOE/JPL—1012-81, pp 121-123) **Coherent detection of scattered light from submicron particles.** Pettit, D. (Univ. of Arizona, Tucson). 1 Feb 1983. NTIS, PC A14/MF A01. (CONF-820879—).

From Science of silicon materials preparation workshop; Phoenix, AZ, USA (23 Aug 1982).

The development of a coherent optical particle spectrometer (COPS) system is discussed. This is an optical system that uses the coherent properties of light to measure the scattered phase instead of the scattered intensity. (LEW)

49786 (IA—1375, pp 240-242) **Tabletop beta-ray irradiator for thin biological samples.** Dahan, S.D.; Pasi, M.; Kalifa, Y. (Israel Atomic Energy Commission, Tel Aviv); Kushelevsky, A.; Manori, I. (Ben-Gurion Univ. of the Negev, Beersheba (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49787 (IA—1375, pp 251-252) **Lingau-1. A FORTRAN program for the optimization of a linear nuclear level gauge.** Pasi, M. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49788 (IA—1375, pp 252-253) **Digital image processing system.** Gayer, A. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49789 (IA—1375, pp 248) **New pulsed NMR transmitter system for high power and high frequencies.** Adler, E.; Barak, J.; Mizrachi, M. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49790 (IA—1375, pp 255) **Measurements of refractive index by Moire deflectometry.** Karni, Z.; Kafri, O. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49791 (IA—1375, pp 117-118) **Non-Doppler velocimetry with transmission gratings.** Glatt, I.; Bar-Ziv, E. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49792 (INIS-mf—7894) **Source of EMF's in thermocouple circuits.** Broomfield, G.H. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 20p. (CONF-8010325—1). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780750.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 1. Paper no. 1.

An explanation is given of how thermocouple voltage signals are generated and the consequences for some property changes and for calibration are illustrated. (U.K.).

49793 (INIS-mf—7895) **Temperature transient response measurement in flowing water.** Rainbird, J.C. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 13p. (CONF-8010325—2). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780751.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 1. Paper no. 2.

A specially developed procedure is described for determining the thermal transient response of thermocouples and other temperature transducers when totally immersed in flowing water. The high velocity heat transfer conditions associated with this facility enable thermocouple response times to be predicted in other fluids. These predictions can be confirmed by electrical analogue experiments. (author).

49794 (INIS-mf—7896) **Rapid response sensor to monitor the temperature and flow of liquid metals.** McCann, J.D. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 22p. (CONF-8010325—3). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780752.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 1. Paper no. 3.

Two forms of a sensor capable of simultaneously monitoring the temperature and flow of liquid metal coolants within a reactor are described. They operate by measuring the coupling impedances between the sensor and the surrounding electrically conductive coolant. Since the system utilises electrical rather than thermal properties, the response to perturbations is rapid, typically displaying the changed conditions within a few milliseconds. The first form of the sensor was designed to operate whilst protected by a thick walled service tube positioned in the reactor coolant. Providing bends in the tube had a radius greater than 70 cm, the sensor could be removed for inspection and maintenance if necessary. The second sensor was fitted inside a streamlined NaK proof capsule. This was inserted directly into the coolant outlet stream of a fuel pin assembly in the Dounreay Fast Reactor. In this form the sensor successfully monitored flow, entrained gas and temperature excursions during the final operating cycle of D.F.R. (author).

49795 (INIS-mf—7897) **Influence of thermal cycling on coaxial thermocouple performance.** Evans, R.A. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 12p. (CONF-8010325—4). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780753.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 1. Paper no. 4.

Coaxial thermocouples offer the desirable combination of high reliability and fast response for monitoring rapid temperature fluctuations over long periods. Prolonged thermal cycling may effect their speed of response. Results from a new method of transient response testing are presented and their implications are discussed. (author).

49796 (INIS-mf—7898) **Novel temperature sensors developed at BNL using mineral insulated cable.** Hughes, G.; Fairbairn, S.A.; Farrington, B.J. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 23p. (CONF-8010325—5). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780754.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 1. Paper no. 5.

The design, construction and performance of an electromagnetic device for measuring temperature fluctuations in liquid sodium is described. The sensing element of this transducer is a coil of mineral insulated stainless steel sheathed cable which can be directly immersed in sodium, or installed in a stainless steel pocket. An alternating current in this coil induces eddy currents into the surrounding sodium. The resulting losses and hence the effective

impedance of the coil are a function of the electrical conductivity of the sodium. Measurement of the impedance of the coil thus gives, indirectly, the temperature of the sodium. (U.K.).

49797 **(INIS-mf—7899) Multiplexing milli-volt transmitter for operation in high ambient temperatures.** Phillips, G.J. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 8p. (CONF-8010325—6). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780755.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 1. Paper no. 6.

A high integrity method of multiplexing up to two hundred and fifty millivolt level signals and transmitting the data to a remote measuring station via a 12 core flexible cable is described. The system was designed for operation in the normally hazardous and therefore inaccessible areas where high ambient temperatures are experienced. Additionally, because one potential application is in nuclear reactor systems, the design is tolerant to high levels of gamma background. The system's high reliability, high integrity and relatively small and conventional cable installation, makes it applicable to situations which depend upon temperature measurement for plant or personnel safety. (author).

49798 **(INIS-mf—7900) Manufacture of thermocouple cables and probes.** Fletcher, G.; Bonikowski, Z. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 16p. (CONF-8010325—7). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780756.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 2. Paper no. 1.

The manufacture of thermocouple cables and probes is described. Details are given of the cable filling, drawing and testing operations. (U.K.).

49799 **(INIS-mf—7901) Magnesium oxide as a high-temperature insulant in M.I. thermocouples.** Wilson, I.O. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 9p. (CONF-8010325—8). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780757.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 2. Paper no. 2.

A description is given of the high-temperature resistivity characteristics of magnesium oxide in the form of a powder of fused magnesia as used as insulant in thermocouples. (U.K.).

49800 **(INIS-mf—7902) Differential thermocouples and gamma detectors.** Colville, P. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 14p. (CONF-8010325—9). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780758.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 2. Paper no. 3.

A description is given of the manufacture of a special differential thermocouple which is the basic component of a gamma thermometer. This instrument has been used to measure the gamma flux density in research reactors. The differential thermocouples described can be used in various applications in the nuclear field, where absolute temperature measurement is not necessary, but only the measurement of small temperature differences between two points. (U.K.).

49801 **(INIS-mf—7903) Development of mineral insulated cable for nucleonic instrumentation.** Mauger, R.A. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 10p. (CONF-8010325—10). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780759.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 2. Paper no. 4.

The development and manufacture of high quality mineral insulated cable for reactor instrumentation use is described. Electrical specifications are set out. The possible conductivity mechanisms in cable MgO and the likelihood that ionic conductivity predominates in the temperature range 300-700° is discussed. The oxidation of iron impurities is considered and the influence of water is identified. (U.K.).

49802 **(INIS-mf—7904) Manufacture of high integrity co-axial thermocouples.** Mills, E.; Page, S. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 11p. (CONF-8010325—11). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780760.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 2. Paper no. 5.

A description is given of the design and manufacture of the single conductor, mineral insulated, coaxial thermocouple. (U.K.).

49803 **(INIS-mf—7907) Application of co-axial thermocouples in the SOMITE facility.** Hill, R.L.; Sephton, K.P. (UKAEA Risley Nuclear Power Development Labs.; Nuclear Power Co. (Risley) Ltd. (UK)). 1980. 15p. (CONF-8010325—14). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780763.

From Seminar on temperature measurements in hostile environments; Warrington, UK (1 Oct 1980).

Session 3. Paper no. 1.

The use of the SoMITE Facility to carry out metallurgical tests on stainless steel and other material specimens is described. The specimens were subjected to high frequency random temperature shocks, which were measured by co-axial thermocouples. The method of processing the signals and presenting the data obtained is described. The advantage of co-axial thermocouples compared with conventional thermocouples and their performance over a long operational period is discussed. (author).

49804 **(INIS-mf—8133) Aspects of input processing in the numerical control of electron beam machines.** Chowdhury, A.K. (Technische Univ., Vienna (Austria)). 30 Jan 1981. 124p. (In German). NTIS (US Sales Only), PC A06/MF A01. Order Number DE83702814.

Thesis.

A high-performance Numerical Control has been developed for an Electron Beam Machine. The system is structured into 3 hierarchial levels: Input Processing, Realtime Processing (such as Geometry Interpolation) and the Interfaces to the Electron Beam Machine. The author considers the Input Processing. In conventional Numerical Controls the Interfaces to the control is given by the control language as defined in DIN 66025. State of the art in NC-technology offers programming systems of differing competence covering the spectra between manual programming in the control language to highly sophisticated systems such as APT. This software interface has been used to define an Input Processor that in cooperation with the Host computer meets the requirements of a sophisticated NC-system but at the same time provides a modest stand-alone system with all the basic functions such as interactive program-editing, program storage, program execution simultaneous with the development of another program, etc. Software aspects such as adapting DIN 66025 for Electron Beam Machining, organisation and modularisation of Input Processor Software has been considered and solutions have been proposed. Hardware aspects considered are interconnections of the Input Processor with the Host and the Realtime Processors. Because of economical and development-time considerations, available software and hardware has been liberally used and own development has been kept to a minimum. The proposed system is modular in software and hardware and therefore very flexible and open-ended to future expansion.

49805 **(JINR—13-82-148) Dual differential precision synchronization discriminator with time-to-amplitude converter.** Basiladze, S.G.; Nguen Tkhi Sha. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy). 1982. 10p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702337.

The dual differential precision synchronization discriminator with a time-of-amplitude converter is described. The zero- crossing scheme is realized on integrated circuits. The delay in timing channel is the setting with external cable. The time shift of discriminator output pulse is 280 ps at 100 mV threshold. The range of low threshold control and "window" is 2.5 V. Output pulse duration is controlled in the 5-400 ns range. The time-to-amplitude converter operates by start-stop principle. The "start" pulse goes from output of the first discriminator and "stop" from the second one. Integral nonlinearity of the converter is 0.3%, its differential nonlinearity is +-6% in the 17-57 ns range.

49806 **(MESA-IR—1040) Review of published experimental calibrations performed on the 10-millimeter nylon cyclone.** Tomb, T.F.; Treaftis, H.N. (Mining Enforcement and Safety Administration, Pittsburgh, PA (USA). Pittsburgh Technical Support Center; Mining Enforcement and Safety Administration, Morgantown, WV (USA). Coal Mine Health and Safety District 3). [nd]. 16p. NTIS, PC A02/MF A01. Order Number DE83902993.

In 1970, the American Industrial Hygiene Association (AIHA) published a Guide for Respirable Mass Sampling. The Guide recommended that a flow rate of 1.7 liters per minute be tentatively adopted for respirable mass samplers employing the Dorr-Oliver 10 mm nylon cyclone. Because calibration data on the 10 mm nylon cyclone was conflicting, provisions were made for revising the Guide when additional data became available. This report presents a review of all the investigative work that has been conducted on the calibration of the 10 mm Dorr-Oliver nylon cyclone for the purpose of recommending an operational flow rate for the 10 mm cyclone that will provide size-selection characteristics that most closely approximate the Atomic Energy Commission (AEC) respirable dust criterion. The significant conclusions from this review were that the amount of experimental scatter in all of the investigations precludes the recommendation of any flow rate to within a tolerance greater than +-0.2 liter per minute and the AEC respirable dust criterion will be more closely approximated when the 10 mm nylon cyclone is operated at a flow rate of 2.0 liters per minute.

49807 **(MESA-IR—1041) Methods factors for anemometer readings at tubing inlets.** Haney, R.A.; Hlavsa, T.C. (Mining Enforcement and Safety Administration, Pittsburgh, PA (USA). Pittsburgh Technical Support Center; Mining Enforcement and Safety Administration, Morgantown, WV (USA). Coal Mine Health and Safety District 3). 1976. 11p. NTIS, PC A02/MF A01. Order Number DE83902992.

Accurate air velocity measurements have been obtained by applying a methods factor to vane anemometer readings at the inlet of an exhaust tubing installation. Methods factors were determined by comparing simultaneous 4-inch rotating vane anemometer readings at the centerline of the tubing inlet to a Pitot-static tube traverse of the duct. Test velocities ranged from approximately 600 to 8600 fpm. Methods factors were independent of velocity but dependent on tubing diameter and tubing entrance configuration. For straight unflanged tubing, the methods factors for 12-, 14-, 16-, 18-, and 20-inch diameter rigid tubing and 24-inch diameter spiral reinforced tubing were 0.69, 0.68, 0.66, 0.74, 0.75, and 0.72, respectively.

49808 **(MESA-IR—1073) Standard calibration and maintenance procedures for wet test meters and coal-mine respirable-dust samplers.** Tomb, T.F.; Treaftis, H.N. (Mining Enforcement and Safety Administration, Pittsburgh, PA (USA). Pittsburgh Technical Support Center). 1978. 21p. NTIS, PC A02/MF A01. Order Number DE83903037.

The Federal Coal Mine Health and Safety Act of 1969 specifies that the concentration of respirable coal mine dust shall be measured using an MRE sampling instrument or a suitable device approved by the Secretary of the Interior and the Secretary of Health, Education, and Welfare. Title 30, Code of Federal Regulations, Part 70, specifies that the flow rate of the MRE instrument shall be 2.5 liters per minute and the flow rate of the other approved personal coal mine dust sampling devices shall be 2.0 liters per minute. The Federal Mine Safety and Health Amendments Act of 1977, which amends the 1969 Act, mandates that these procedures continue. This informational report presents the standard procedures used by the Mining Enforcement and Safety Administration (MESA) for calibration of the MRE and currently approved personal samplers and associated equipment and maintenance procedures for the equipment.

49809 **(NIIAR—62(515)) Modules for small computerized measuring systems on the base of the Vector crate.** Baklanov, V.S.; Krivosheev, V.A.; Loginov, V.D.; Shipilov, V.I. (Nauchno-Issledovatel'skij Inst. Atomnykh Reaktorov, Dimitrovgrad (USSR)). 1981. 14p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83701470.

Paper copy only, copy does not permit microfiche production figs.

Digital modules used in small computerized measuring systems on the base of the vector crate are described. The flowsheets and the main characteristics of a programmed controller module, a program control module, interfaces for colour or black-and-white TV display devices as well as the main parameters of an on-line memory module, a timing module, a module of digital-to-analog converters, a manual controller module, an on-line display module and a module of manual control are given. On the base of the modules under consideration the computerized alpha and gamma spectrometers, x-ray radiometric analyzer and devices for fuel element quality control are developed.

49810 **(SAND—83-0654C) Carbon piezoresistive stress gauge.** Williams, W.D.; Fogelson, D.J.; Lee, L.M. (Sandia National Labs., Albuquerque, NM (USA); Ktech Corp., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 5p. (CONF-830719—40). NTIS, PC A02/MF A01. Order Number DE83016505.

From American Physical Society meeting on shock waves in condensed media; Santa Fe, NM, USA (18 Jul 1983).

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The response of the carbon piezoresistive stress gauge has been measured in simple and complex shock-induced stress fields. The carbon gauge is encapsulated in either a castable epoxy or alumina-filled epoxy and shocked. The gauge response is measured under both gas gun generated, planar shock wave loading and explosive driver generated, divergent shock wave loading. The experimental records are compared to two-dimensional, axisymmetric computer calculations of the mean stress and component stresses. We find good agreement between the gauge response and the stress component normal to the plane of the gauge.

49811 **(UCRL—89422) Fabry-Perot velocimetry techniques: is Doppler shift affected by surface-normal direction.** Goosman, D.R.; Frank, A.M.; Chau, H.H.; Parker, N.L. (Lawrence Livermore National Lab., CA (USA)). 29 Jun 1983. Contract W-7405-ENG-48. 11p. (CONF-830874—11). NTIS, PC A02/MF A01. Order Number DE83015902.

From 27. annual international technical symposium on high speed photography, videography and photonics; San Diego, CA, USA (21 Aug 1983).

The Fabry-Perot laser velocimeter is used at LLNL for hydrodynamic, equation-of-state, surface-ejecta mass measurements and for other applications. Velocities of shocked surfaces can be measured to better than 1%, and multiple records can be superimposed on a single piece of film. Many phenomena are being investigated for possible sources of error. One concern was whether the direction of the surface normal could affect the measured Doppler shift, or whether the direction of the particle velocity was sufficient to determine the shift. A series of experiments with angles between the laser and particle velocity as small as 20° have shown that for the surface smoothnesses that we encounter, we see no effect caused by varying the direction of the surface normal.

49812 Construction and operation of an on-line mass separator for alkali ions from thermal fission of ^{235}U. Reisky von Dubnitz, L. Mainz, Germany, F.R.; Mainz University (1978). 74p. (In German). Available from the library of Mainz Univ. (Germany, F.R.).

Diss. (D.Sc.).

In the present thesis an on-line mass separator for alkali isotopes is presented and discussed which was constructed at the Mainz TRIGA research reactor. The alkali isotopes are thereby produced in a ^{235}U target near the core of the reactor by the fission of the uranium by thermal neutrons, diffuse from the target material, and are after surface ionization at the exit opening of the target furnace transferred by ion optics to the separator magnet and finally to the measuring place.

4404 Well Logging Instrumentation

REFER ALSO TO CITATION(S) 48625, 48740, 49620

45 EXPLOSIONS AND EXPLOSIVES

4502 Nuclear

49813 (NVO—211) Project Gasbuggy site restoration. Final report. (Holmes and Narver, Inc., Las Vegas, NV (USA). Energy Support Div.). Jul 1983. 73p. (PNE-G—90). NTIS, PC A04/MF A01. Order Number DE83016448.

Project Gasbuggy included the detonation of a 29-kiloton nuclear device on December 10, 1967, at a depth of 4240 feet in the San Juan basin of northwestern New Mexico. The site restoration planning phase began in early 1978 and was completed in July 1978 with the issuance of the operational plan for well plugging and site restoration activities, NVO-195. The field activities were conducted over a six-week period during August and September of 1978. This report summarizes the field activities and describes the final site status, including the disposition of all project facilities and final surface and subsurface configurations.

49814 (UCRL—14397-Rev.2) Total mass and concentration of particles in dust clouds. Gutmacher, R.G.; Higgins, G.H.; Tewes, H.A. (Lawrence Livermore National Lab., CA (USA)). Mar 1983. Contract W-7405-ENG-48. 25p. NTIS, PC A02/MF A01. Order Number DE83016636.

The clouds from seven Pacific Proving Grounds nuclear tests and two Plowshare cratering experiments have been sampled to determine the mass loading of the clouds. The average value for the total mass of debris from surface bursts of megaton yield is 0.2 Mt mass/Mt yield; the measured particle concentration in air ranges from 6×10^{-10} to 7×10^{-9} g/cm^3. The mass of debris per unit yield from cratering explosions is about two orders of magnitude higher than is the case for surface bursts, but only a small percentage of the mass is still present in the cloud after a few minutes. The average concentration of dust in explosion-produced clouds is in the same range as the mass concentration measured in naturally occurring high tropospheric clouds.

49815 (UCRL—50016-83-2) Mechanical engineering department technical abstracts. Denney, R.M. (ed.). (Lawrence Livermore National Lab., CA (USA)). 1 Jul 1983. Contract W-7405-ENG-48. 28p. NTIS, PC A03/MF A01. Order Number DE83016633.

Overall information about general and current activities in the areas of nuclear test engineering, nuclear explosives engineering, weapons engineering, energy systems engineering, engineering sciences, magnetic fusion engineering, and materials fabrication is given, followed by technical abstracts of publications covering recent efforts in these areas. (LEW)

49816 (UCRL—89411) Determination of subsurface geological structure with borehole gravimetry. Clark, S.R.; Hearst, J.R. (Lawrence Livermore National Lab., CA (USA)). Jul 1983. Contract W-7405-ENG-48. 8p. (CONF-830882—6). NTIS, PC A02/MF A01. Order Number DE83016565.

From 2. containment symposium; Albuquerque, NM, USA (2 Aug 1983).

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Conventional gamma-gamma and gravimetric density measurements are routinely gathered for most holes used for underground nuclear tests. The logs serve to determine the subsurface structural geology near the borehole. The gamma-gamma density log measures density of the rock within about 15 cm of the borehole wall. The difference in gravity measured at two depths in a borehole can be interpreted in terms of the density of an infinite, homogeneous, horizontal bed between those depths. When the gravimetric density matches the gamma-gamma density over a given interval it is assumed that the bed actualy exists, and that rocks far from the hole must be the same as those encountered adjacent to the borehole. Conversely, when the gravimetric density differs from the gamma-gamma density it is apparent that the gravimeter is being influenced by a rock mass of different density than that at the hole wall. This mismatch can be a powerful tool to deduce the local structural geology. The geology deduced from gravity mesurements in emplacement hole, U4al, and the associated exploratory hole, UE4al, is an excellent example of the power of the method.

4503 Explosion Detection

49817 (AD-A—127430/7) Seismic discrimination at regional distance. Final report 1 Oct 81-30 Sep 82. Priestley, K.F.; Ryall, A.S. (Nevada Univ., Reno (USA). Seismological Lab.; Air Force Office of Scientific Research, Washington, DC (USA)). 21 Mar 1983. 44p. NTIS, PC A03/MF A01.

The research supported by this grant is directed towards the general problems of discrimination and yield estimation. During the past year has evolved along two lines: 1) analysis of stress variation within the crust and its possible effects on tectonic release; and 2) effects of large scale mantle structure and crustal focusing/defocusing on parameters such as m, trace amplitude, period and t over short distances near the Faultless shot point. In section I and appendix A, the effects of stress distribution within the Great Basin crust are examined. Detailed studies of focal mechanisms for several areas in the western Great Basin show a systematic change from strike-slip motion at shallow depths to oblique or normal slip at depth. Explosions detonated in Nevada show asymmetric Rayleigh wave radiation and significant Love wave excitation, usually consistent with a strike-slip mechanism. This has been puzzling in an extensional tectonic environment, where major earthquakes are known to have primarily dip-slip motion. However, it is entirely consistent with our observation that small-to-moderate earthquakes at shallow depth in the western Great Basin are predominantly strike-slip. An explanation for this behavior is provided in terms of rotation of the axis of maximum compressive stress due to increasing overburden pressure with depth.

50 ENVIRONMENTAL SCIENCES, ATMOSPHERIC

5001 Basic Studies

49818 (DOE/NV/10162—10) Preliminary analysis of precipitation in southern Nevada. French, R.H. (Nevada Univ., Reno (USA). Center for Water Resources Research). Apr 1983. Contract AC08-81NV10162. 48p. NTIS, PC A03/MF A01. Order Number DE83016648.

The distribution of precipitation in both time and space in the southern Nevada area is examined. It is concluded that this area can be divided into two zones of precipitation separated by a transition zone on the basis of annual average precipitation. One region, relative to the other area, is defined to be a deficit annual average precipitation region. This observation could have a significant impact on groundwater recharge estimates and on the siting of facilities which must be protected from flash floods. In addition, precipitation records at three stations in the southern Nevada area were examined and point intensity/duration relationships were derived for these stations.

49819 (IA—1375, pp 209-210) **Studies of atmospheric flow over complex terrain.** Asculai, E.; Doron, E.; Terliuc, B. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49820 **(IC—81/149) Helmholtz equation and WKB approximation in the tidal wave propagation.** Makarious, S.H. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1981. 26p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702311.

The homogeneous radial equation of atmospheric tides has been solved numerically, through its analogy with the Helmholtz equation, adopting a realistic temperature structure below 110 km. A linear law for the variable coefficient is assumed and the relationships between exact solutions of the equation and the WKB approximations are therefore illustrated. The analysis has been carried out for two types of wave propagation: the oscillatory and the trapped modes of the diurnal and semidiurnal oscillations.

49821 **(JINR—R-2-82-74) Glauber amplitude calculation method. Pt. 2. The A + B → A + X reaction cross sections.** Omboo, Z. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems). 1982. 9p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702312.

In the framework of eikonal approach the problem of calculating cross section of the composed system quasielastic scattering is considered. The one-particle densities of the system as well as the constituent elastic scattering amplitude are given by Gaussian functions. The calculation algorithm of these cross sections based on using diagram, representation of Glauber expansion terms is proposed. By this algorithm after having integrated the multidimensional Gaussian functions by any coordinate of constituent system a concept of a scattering diagram was used. It enables one to execute reducing of similar members of Glauber series.

49822 **(LBL—16155) Ventilation effectiveness - a guide to efficient ventilation.** Skaaret, E.; Mathisen, H.M. (Lawrence Berkeley Lab., CA (USA)). May 1983. Contract AC03-76SF00098. 22p. (CONF-830640—7). NTIS, PC A02/MF A01. Order Number DE83016112.

From ASHRAE conference; Washington, DC, USA (26 Jun 1983).

A two-zone mixing model describes the concept(s) of and defines the effectiveness of ventilation. Multiroom aspects and procedures for measuring ventilation effectiveness are dealt with. The simple two-zone model, experimentally verified by laboratory tests, predicts generally high effectiveness for ventilating systems using the displacement principle, taking advantage of stratification. Tests using this principle in an office room for one to three persons (28 m^2, 2.8 m ceiling height), are reviewed. Stratification was secured by supplying the ventilation air with a temperature always lower than the air temperature in the zone of occupation. Necessary heating of the room was provided for by using panel heaters under the windows; the air supply was located at the opposite wall. Seasonal variations are addressed.

49823 **(LBL—16302) Laboratory studies of the temperature dependence of the Palmes NO_2 passive sampler.** Girman, J.R.; Hodgson, A.T.; Robison, B.K.; Traynor, G.W. (Lawrence Berkeley Lab., CA (USA)). Jun 1983. Contract AC03-76SF00098. 18p. (CONF-8305106—2). NTIS, PC A02/MF A01. Order Number DE83016190.

From 3. annual national symposium on recent advances in pollutant monitoring of ambient air and stationary sources; Raleigh, NC, USA (4 May 1983).

Passive samplers for air pollution measurement have been used in a variety of applications, e.g., the assessment of personal exposures to pollutants, the determination of area concentrations, and the comparison of indoor and outdoor pollutant concentrations. In some of these applications, samplers have been used under conditions for which they have been inadequately tested. Diffusion theory predicts only a 1.7% change in the sampling rate with a 10°C change in temperature at 21°C; however, triethanolamine, the NO_2 absorbent employed in the Palmes NO_2 sampler, has a liquid-solid phase transition at 21°C. Because this phase change occurs at a typical ambient temperature, the effect of temperature upon the performance of the sampler was investigated. During this investigation, the NO_2 concentration, exposure time, and face velocity were held constant while the temperature of the sampled air was varied from 7°C to 38°C. The collection efficiency of the Palmes NO_2 passive sampler was found to decrease by 15% when the temperature decreased from 27°C to 15°C. This study illustrates the need for careful evaluations of passive samplers under controlled conditions that closely approximate actual use conditions.

49824 **(PNL—4797) Transport of tracers and pollutants from the Geysers Geothermal Resource Area.** Orgill, M.M.; Lee, R.N.; Schreck, R.I. (Pacific Northwest Lab., Richland, WA (USA)). Aug 1983. Contract AC06-76RL01830. 36p. NTIS, PC A03/MF A01. Order Number DE83016335.

An initial analysis of both surface and aerial SF_6 tracer data from the Geysers illustrates the importance that terrain, vertical wind shear, time-varying winds and stability have on the downwind distribution of cooling tower effluents during the daytime. Atmospheric stability and near surface winds above 3 m/s results in fumigation and surface impaction of a portion of cooling tower plumes on downwind surfaces and terrain. Vertical wind shear and possible gravity waves in upper-levels (~ 1800 to 2000 m m.s.l), in addition, to terrain influences assist in distributing plumes horizontally and in the vertical at relative short (~ 10 to 20 km) distances from the source. Small quantities of gaseous sulfur, primarily H_2S, are transported up to 20 km or more from the Geysers area. A variety of trace materials such as sulfate, copper, zinc, arsenic, bromine, lead, antimony, selenium and barium appear to be enriched over background levels and transported downwind from the Geysers Area at times.

49825 **(PNL-SA—11551) TRAN-STAT statistics for environmental studies, issue No. 24, August 1983. Field sampling designs, simple random and stratified random sampling.** Gilbert, R.O. (Pacific Northwest Lab., Richland, WA (USA)). Aug 1983. Contract AC06-76RL01830. 38p. NTIS, PC A03/MF A01. Order Number DE83016826.

Several methods are discussed by which sampling locations and times for environmental studies may be selected including haphazard, judgment, probability, and systematic methods. In practice, a given sampling plan may be a composite of several methods (excluding haphazard sampling which should always be avoided). The probability methods such as simple and stratified random sampling have the nice statistical property of being statistically unbiased, but systematic sampling may give a more accurate estimate of means and totals. Judgment must be used in defining the target population of units to be sampled, and the patterns of variation over time and space that should be considered when designing the study. But biased estimates of parameters can result if an individual chooses subjectively the exact location and times a sample or measurement is taken. The allocation of samples to different regions or strata (in time or space) can be determined using formulas presented here if there is advance information available on costs of sampling and the variances for each strata. Some suggestions are made for how to treat less-than and negative data when computing means and variances. The effects on anti x and s^2(anti x) when measurement errors, perhaps correlated, are present is also discussed. The method of interpenetrating subsamples is given as a way of estimating Var(anti x) when measurement errors within subsamples are correlated. 40 references.

5002 Chemicals Monitoring And Transport

REFER ALSO TO CITATION(S) 48586, 49562, 49814, 49823, 49824, 49853, 50067

49826 **(BFR-R—88-1982) Radon in dwellings. A method for the calculation of radon daughters in dwellings.** Bergstroem, B.; Clavensjoe, B. (Statens Raad foer Byggnadsforskning, Stockholm (Sweden)). 1982. 38p. (In Swedish). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702399.

The aim of the project was to present a mathematical model for the calculation of the expected values of radon and radon

daughters of indoor air. It is assumed that certain parameters can be made available, such as the emission of radon from building materials, leakage from soil to buildings, the contents of radon in water etc. The control of dose limits can thus be made by the constructor of buildings.

49827 (BNL—33441) Advanced technologies for the recovery, disposal, and reuse of carbon dioxide for atmospheric control. Steinberg, M. (Brookhaven National Lab., Upton, NY (USA)). Jul 1983. Contract AC02-76CH00016. 33p. (CONF-831063—3). NTIS, PC A03/MF A01. Order Number DE83016371.

From American Institute of Chemical Engineers fall annual meeting; Washington, DC, USA (30 Oct 1983).

Several technologies for controlling CO_2 content in the atmosphere, which may be useful in mitigating the possible CO global greenhouse effect are examined. These relate to recovery of CO_2 from the atmosphere, removal of CO_2 from fosil fuel burning plants, the disposal of CO_2 in the ocean and in depleted wells and salt domes, and the use of CO_2 for the production of synthetic fuels. Evaluation of some of these systems are presented in terms of energy costs.

49828 (DOE/EV/10403—11) Application of multivariate source/receptor models to aerosol mass apportionment. Hopke, P.K. (Illinois Univ., Urbana (USA)). 1983. Contract AC02-80EV10403. 8p. (CONF-8305115—1). NTIS, PC A02/MF A01. Order Number DE83014592.

From 6. world congress on air quality; Paris, France (16 May 1983).

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Over the past decade, a number of approaches have been explored to utilize the chemical or physical properties of collected particles to identify their origins and to apportion the aerosol mass to sources. The most widely used method, called the chemical element balance (CEB) method, assumes that the number of source types and the elemental composition of particles from those sources are known. The mass contribution of each source to each sample is calculated using a multiple regression method. In an effort to examine how much information can be directly extracted from the data, alternative methods using multivariate statistical methods have been explored. A modified form of factor analysis called target transformation factor analysis has proven to be useful in resolving aerosol sources. In TTFA, the correlation about the origin is used as the dispersion matrix and factor rotations are made in unnormalized space. The basic concepts of the TTFA method are presented. The resolution of a data set consisting of fine particle samples taken during the Regional Air Pollution Study of St. Louis, MO at site 103 yielded five source types: motor vehicles, smelters, soil/flyash, secondary sulfate, and a fugitive dust source probably from an adjacent fertilizer processing plant. 20 references.

49829 (DOE/NBB—0039) International carbon dioxide-related activities: the international organizations involved and US bilateral arrangements. Dougher, R. (Oak Ridge Associated Universities, Inc., TN (USA)). Jul 1983. Contract AC05-76OR00033. 42p. NTIS, PC A03/MF A01. Order Number DE83016013.

The issue of increasing carbon dioxide in the atmosphere, its measurement and possible impact, is one of global dimensions. Several organizations with international membership are actively involved in efforts to resolve the unanswered questions surrounding this issue. This paper describes broadly these international organizations and the type of CO_2-related activities they conduct and outlines the CO_2 research work conducted through US biliateral arrangements. The major international organizations that engage in CO_2-related research are the World Meteorological Organization (WMO), the United Nations Environment Programme (UNEP), the International Council of Scientific Unions (ICSU), the Scientific Committee on Problems of the Environment (SCOPE), the European Community, the International Energy Agency (IEA), the International Institute for Applied Systems Analysis (IIASA), and the International Atomic Energy Agency (IAEA).

49830 (EPRI-EA—2048-Vol.5) Control of nitrogen oxides: assessment of needs and options. Volume 5. Emissons control technology for combustion sources. Technical support document. Final report. Muzio, L.J.; Pease, R.R.; Curry, P.; Garcia, F.J. (KVB, Inc., Irvine, CA (USA)). Jul 1983. 390p. NTIS, PC A17/MF A01. Order Number DE83902946.

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This is the fifth volume of a six-volume reference set designed to provide information required by electric-utility readers to contend with several pending NO/sub x/- related regulatory changes. This volume describes available emissions control technologies for both utility and non-utility combustion devices which are significant sources of NO/sub x/. The costs and levels of emissions control are included with the technology descriptions. Non-utility sources are discussed because it may become increasingly important for the utility to be aware of the capabilities and costs of NO/sub x/ controls on non-utility sources. This is due to the likelihood that requirements for NO/sub x/ emissions offsets will increase.

49831 (LBL—14574) Sources and concentrations of formaldehyde in indoor environments. Girman, J.R.; Geisling, K.L.; Hodgson, A.T. (Lawrence Berkeley Lab., CA (USA)). Jun 1983. Contract AC03-76SF00098. 26p. (CONF-820627—18). NTIS, PC A03/MF A01. Order Number DE83015945.

From 75. annual meeting of the Air Pollution Control Association; New Orleans, LA, USA (20 Jun 1982).

Formaldehyde is used as an inexpensive chemical component of resins commonly used in many building materials. As is now well known, the formaldehyde in these resins can be released from building materials into the indoor environment. In addition, unvented combustion appliances such as gas ranges and heaters emit formaldehyde as a product of incomplete combustion. In this study, we summarize formaldehyde emission rates from a variety of combustion appliances and the formaldehyde concentrations observed in forty residential indoor environments. If the combustion appliance is well tuned, it appears that high formaldehyde concentrations are not produced under most conditions of use. Energy-efficient houses were generally found to have higher concentrations than those observed in weatherized houses, with about a third being above the ASHRAE guideline, 100 ppB. The ventilation rate was shown to have a strong effect on formaldehyde concentrations in about half the houses studied when the ventilation was varied but had little effect in other cases. This anomaly should be studied further.

49832 (LBL—14959) Radon in energy-efficient earth-sheltered structures. Nero, A.V. (Lawrence Berkeley Lab., CA (USA)). May 1983. Contract AC03-76SF00098. 9p. (CONF-830835—1). NTIS, PC A02/MF A01. Order Number DE83015992.

From Energy efficient buildings with earth shelter protection; Sydney, Australia (1 Aug 1983).

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Exposure o the radioactive-decay products of radon 222 that are present in indoor air constitutes the most-significant radiation dose received by the general population in most countries. Indoor concentrations vary from one building to another, ranging from insignificant to very high levels that cause radiation doses higher than those experienced by uranium miners. This wide range of concentrations is attributable to variability in the rate at which radon enters buildings, and differences in the ventilation rate. Earth-sheltered dwellings, because they are more completely surrounded by earth material than other structures, have an as yet unquantified potential for having radon entry rates that are higher than typical for other houses in the region. Moreover, measures that save energy by reducing ventilation rates (for example by reducing infiltration) can also raise indoor radon concentrations. For these reasons a significant effort is needed to determine the potential for ventilation-reducing measures and earth sheltering to increase radon concentrations, especially in regions where they are already high. Where necessary, proper attention to specific design features that affect radon entry rates or residence time indoors should be adequate to avoid undue risk to the public.

49833 (MESA-IR—1013) Wet auger: respirable-dust control for underground auger continuous-mining machines. Pendergast, J.J.; Ison, W.D.; Sutherland, W.H. (Mining Enforcement and Safety Administration, Norton, VA (USA). Coal Mine Health and Safety; Mining Enforcement and Safety Administration, Washington, DC (USA). Coal Mine Health and Safety). 1975. 10p. NTIS, PC A02/MF A01. Order Number DE83902961.

In an effort to reduce the high-level respirable dust concentrations produced by auger-type continuous miners to the 2.0 mg/m³ (milligrams of dust per cubic meter of air) standard, a water transfer mechanism has been developed to pass water from the stationary miner through the hollow core of the rotating augers to spray nozzles installed on the augers. This through-auger spray system has reduced the average respirable dust concentrations of the return-side jacksetter (high-risk occupation), and the milligrams of airborne respirable dust generated from each ton of coal produced, by more than 60%.

49834 (ORAU/IEA—82-10(M)) Development of a data base for carbon dioxide releases resulting from conversion of land to agricultural uses. Richards, J.F.; Olson, J.S. (Duke Univ., Durham, NC (USA). Dept. of History; Oak Ridge National Lab., TN (USA); Oak Ridge Associated Universities, Inc., TN (USA)). Jul 1983. Contract AC05-76OR00033;W-7405-ENG-26. 145p. (ORNL/TM—8801). NTIS, PC A07/MF A01. Order Number DE83015728.

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Published information on worldwide conversion of land to regular agricultural uses for the periods 1860 to 1920 and 1920 to 1978 is summarized. New estimates are made for nation-by-nation conversion of land into permanent cropland. Estimated carbon content was tabulated for each type of vegetation removed. The estimated increased releases of CO_2 are presented by country or colony and by world region, and in a global summary for the two chronological periods. A global tabulation excluding Greenland and Antarctica, reveals that approximately 440 million hectares were converted to arable land between 1860 and 1920, increasing during 1920 to 1978 to 470 million hectares. Shrinkage of arable land within individual countries - which presumes reversion to woodland or lesser vegetation - totaled only 8.7 million hectares in the first period in contrast to 51 million hectares in the second period. Expansion of regularly cropped area resulted in releases of nearly 39×10^9 tons of carbon from the live plant mass during the 118-year period. Preliminary estimates of losses from oxidation of humus from the same area were smaller, amounting to about 23×10^9 tons of carbon.

49835 (ORNL/TM—8810) Chemical characterization and toxicologic evaluation of airborne mixtures: chemical characterization of combusted inventory red and violet smoke mixes. Rubin, I.B.; Buchanan, M.V.; Moneyhun, J.H. (Oak Ridge National Lab., TN (USA)). Oct 1982. Contract W-7405-ENG-26. 43p. NTIS, PC A03/MF A01. Order Number DE83016429.

Red and violet smoke grenades (Grenade, Hand, Smoke, M18) were combusted within canvas tents and the combustion products were sampled and analyzed. Uncombusted red and violet smoke mixes from the same lots used to fill the combusted grenades were also analyzed. Approximately ten percent of the major dye component of the red smoke mix, methylaminoanthraquinone (MAA) was converted to aminoanthraquinones (1-AA and 2-AA). The violet smoke mix was formulated to contain 1,4-diamino-2,3-dihydroanthraquinone (DAA) and MAA. Upon combustion the DAA was converted almost completely to diaminoanthraquinone (DAA) which was a minor constituent of the uncombusted mix. As in the combusted red smoke mix, it was found that MAA was partially converted to aminoanthraquinones.

49836 (PB—83-204347) Catalog of the existing short range experiment (SRE) data base (addendum to NOAA (National Oceanic and Atmospheric Administration) Technical Memorandum ERL ARL-80). Technical memo. Flythe, M.C.; Amlicke, B.B. (Mission Research Corp., Alexandria, VA (USA)). Apr 1983. 310p. NTIS, PC A14/MF A01.

The Short Range experiment (SRE) data base has been used as experimental data to verify boundary layer, short range atmospheric transport models. To make this data base more useful, a study was conducted to (1) analyze the contents of the SRE data base, (2) assess problem areas within the SRE data base, (3) determine the applicability of the SRE data to specific classes of models, and (4) recommend methods to exploit the SRE data for model development. This document reports the findings of this study.

49837 (PNL—4787) MAP3S precipitation chemistry network: sixth periodic summary report (1982). Rothert, J.E.; Dana, M.T. (Pacific Northwest Lab., Richland, WA (USA)). Jul 1983. Contract AC06-76RL01830. 279p. NTIS MF A01. Order Number DE83016875.

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This report contains complete field and chemical data from the MAP3S Precipitation Chemistry Network for the year 1982. Included is an update on network status and a summary of the USGS blind sample analysis program and laboratory sample exchanges during 1982. The statistical summary is deferred to a forthcoming publication.

49838 (UCRL—52000-83-4) Energy and Technology Review. (Lawrence Livermore National Lab., CA (USA)). Apr 1983. Contract W-7405-ENG-48. 41p. NTIS, PC A03/MF A01. Order Number DE83013026.

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Articles in this issue include modeling air pollution, nuclear proliferation, and the national magnetic fusion energy computer network. (GHT)

49839 (UCRL—52000-83-4, pp 1-16) Modeling urban air pollution. Apr 1983. NTIS, PC A03/MF A01.

In Energy and Technology Review.

A two-dimensional regional air quality model has been developed. The model and its application to the San Francisco Bay area are described, techniques for sensing pollutants and cross-path wind speeds remotely discussed, and testing of the model with particular attention to ozone described. (ACR)

49840 (UCRL—88605) Atmospheric field experiments for evaluating pollutant transport and dispersion in complex terrain. Gudiksen, P.H.; Dickerson, M.H.; Lange, R.; Knox, J.B. (Lawrence Livermore National Lab., CA (USA)). 9 Jun 1983. Contract W-7405-ENG-48. 22p. (CONF-8309130—1). NTIS, PC A02/MF A01. Order Number DE83016365.

From 14. international technical meeting on air pollution modeling and its applications; Copenhagen, Denmark (27 Sep 1983).

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Three series of field experiments have been carried out in The Geysers geothermal area in northern California. The initial series, conducted during July 1979, in the Anderson Creek valley of The Geysers area were exploratory in nature and of limited scope to gain initial insight into the structure of the drainage flows. As a result of these experiments, a second series of experiments were conducted during September 1980 in the same valley to acquire more detailed information about the temporal and spatial characteristics of drainage flows and their interaction with the regional and synoptic scale flows. In contrast to these generic studies of the transport and dispersion of pollutants entrained in drainage flows, the third series of experiments, conducted during August 1981 in the Big Sulfur Creek valley of The Geysers, was designed to (1) acquire data needed to predict the impact of the hydrogen sulfide emissions from future geothermal power plant cooling tower plumes during nocturnal drainage flows, and (2) to perform nocturnal drainage flow studies in a new environmental setting and to test the general applicability of the methodologies developed from the experimental studies in the Anderson Creek valley. This report provides an overview of the experimental designs, highlights some of the results, and discusses the application of the results for improving a three-dimensional mass-consistent wind field model and particle-in-cell transport and diffusion model.

5003 Radioactive Materials Monitoring And Transport

REFER ALSO TO CITATION(S) 48661, 49009, 49864, 49865, 50034, 50314

49841 (DOE/EP—0096) Guide for effluent radiological measurements at DOE installations. Corley, J.P.; Corbit, C.D. (Pacific Northwest Lab., Richland, WA (USA)). Jul 1983. Contract AC06-76RL01830. 133p. NTIS, PC A07/MF A01. Order Number DE83016639.

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Effluent monitoring and reporting programs are maintained at all US Department of Energy (DOE) facilities that may: (1) discharge significant concentrations of radioactivity in relation to applicable standards, or (2) discharge quantities of radioactivity that have potential health and safety or other environmental significance. This Guide is intended to provide supplemental guidance to DOE Orders on methods, procedures, and performance criteria to bring more comparable rationale to DOE facility effluent measurement programs and promote compliance with applicable standards and provide the DOE Office of Operational Safety (OOS) and Operations Offices with an additional tool for evaluating effluent measurement programs at DOE facilities.

49842 (DOE/EV—0005/40) Formerly utilized MED/AEC sites Remedial Action Program. Radiological survey of the Albany Metallurgical Research Center, United States Bureau of Mines, Albany, Oregon. Wynveen, R.A.; Smith, W.H.; Sholeen, C.M.; Justus, A.L.; Flynn, K.F. (Argonne National Lab., IL (USA)). Jun 1983. Contract W-31-109-ENG-38. 171p. (ANL-OHS/HP—83-102). NTIS, PC A08/MF A01. Order Number DE83016728.

During the periods 1954 to 1956 and 1960 to 1971, the Albany Metallurgical Research Center (AMRC) was engaged in metallurgical operations that included melting, machining, welding, and alloying of thorium. In addition, research on alloys of uranium and thorium started in 1955 and continued until suspended in 1978. Records indicated that at the time the original AEC contract was terminated, buildings and surrounding areas were decontaminated to the general guidelines provided by the AEC. Those guidelines were not as specific as current guidelines, and detailed records of the final decontamination were not documented. Because of that, radiological assessemnt of this site was initiated in June 1978. During June and July 1978, a radiological survey of the grounds and the buildings was completed. Certain buildings were designated as areas where no survey was necessary; however, it was decided by the ANL survey team to at least perform floor surveys in those buildings. Significant levels of contamination, both loose and fixed, were found in 10 of the 33 buildings surveyed. In addition, about 60 contaminated areas, including 17 with loose contamination, were found outside the buildings. Surveys of the sanitary sewers, the Albany sewage treatment plant and the Ohling Farm showed no significant contamination. Significant levels of contamination were found in the septic system behind Buildings 12 and 17. Air samples taken throughout the site revealed no radon concentrations in excess of the limits proposed by the US Surgeon General (10 CFR 712).

49843 (INIS-BR—08) Environmental radiocontamination. Search for ^{210}Po And ^{226}Ra in air and in water. de Andrade, S.A. (Minas Gerais Univ., Belo Horizonte (Brazil). Dept. de Engenharia Nuclear). 1981. 84p. (In Portuguese). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702770.

Thesis.

Search for and determination of ^{226}Ra and ^{210}Po in the environment are dealt with. Emphasis is given to water and atmospheric air collected in uranium mines and ore milling enclosures. It is known that natural radioactive elements of ^{238}U and ^{232}Th series are found dispersed in the environment and may cause major or minor problems in living beings. The harmful effects occur by external exposure, ingestion and inhalation. Among the most important nuclides are ^{226}Ra and its daughters: ^{222}Rn, ^{218}Po, ^{214}Pb, ^{214}Bi, ^{214}Po, ^{210}Bi and ^{210}Po, all of them belonging to the uranium series. ^{226}Ra and ^{210}Po were chosen for this search due to several important factors: their half-life; the fact that they are high-energy alpha emitters; the chemical similarity of radium and calcium which may result in bone irradiation when these elements are metabolized; and the fact that ^{210}Po is a chemical and radioactive toxic agent for the respiratory system. Results are compared with permissible values according to national and international radiation protection rules. (I.C.R.).

49844 (INIS-mf—8099) Atmospheric dispersion and dose calculation. Vogt, S. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 29p. (CONF-8009308—21). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702762.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

During incidents but also in routine operation radionuclides from nuclear facilities are released into the atmosphere. The resulting radiation impact on the population is in most cases completely 'veiled' by the natural radiation varying with space and time, and can be measured in exceptional cases only. Therefore, diffusion calculations must be used for determination. Measured variables, such as activity release rates and meteorological data are included in the diffusion calculations as well as dispersion parameters and dose factors. The dispersion parameters, which are determined experimentally, are a measure of the plume size. The dose factors allow to convert the activity concentration into the dose equivalent. Some results of diffusion calculations are indicated as examples for the environment of the Karlsruhe Nuclear Research Center. A distinction is made between short term and long term releases of activity.

49845 (MESA-IR—1020) Application of statistics to radiation surveys in mines. Misaqi, F.L. (Mining Enforcement and Safety Administration, Arlington, VA (USA). Metal and Nonmetal Mine Health and Safety). 1975. 28p. NTIS, PC A03/MF A01. Order Number DE83903047.

This publication emphasizes the practical application and importance of counting statistics in analyzing radiation samples from radiation surveys of mines; it explains the random nature of measurements, illustrates statistical treatment of data; and shows the need for planning of sampling procedures on the basis of statistical criteria. The primary purpose of this publication is to familiarize mine inspectors and safety engineers with the seemingly complex subject of radiation data evaluation in terms of both practical and statistical accuracy through an extensive use of examples and sample problems.

49846 (MSHA/IR—1099) Radon-daughter growth with continuous radon influx and various ventilation rates. Beckman, R.T.; Holub, R.F. (Mine Safety and Health Administration, Denver, CO (USA). Health and Safety Analysis Center; Bureau of Mines, Denver, CO (USA). Denver Mining Research Center). 1979. 16p. NTIS, PC A02/MF A01. Order Number DE83902833.

Radon and radon-daughter control are very critical problems in the mining industry. Efficient ventilation remains the primary control method for these contaminants and detailed ventilation evaluations often involve the measurement of both the radon-gas and the radon-daughter concentrations. The ratio between these two values, called the equilibrium ratio or factor or working-level ratio, is used as a measure of ventilation efficiency and is commonly reported as percent equilibrium or age of air. The age of air values are often taken from classical growth curves that describe the growth in initially pure radon. This condition is not normally present in active mines, so this study was performed to determine the effects of continuous radon influx with varying ventilation rates. Mathematical methods used to calculate the radon-daughter growth for the tunnel situation, continuous radon influx with various ventilation rates, are given in this report. The use of classical growth curves to determine age of air will lead to erroneous results where radon is continuously emanating. The use of the curves presented in this report will give a more realistic estimation of the conditions present and better rationale for ventilation changes.

49847 **(RISO-M—2327) Statistical theory on the turbulent diffusion of Gaussian puffs.** Mikkelsen, T.; Larsen, S.E.; Pecseli, H.L. (Risoe National Lab., Roskilde (Denmark)). Dec 1982. 102p. NTIS (US Sales Only), PC A06/MF A01. Order Number DE83702413.

The relative diffusion of a one-dimensional Gaussian cloud of particles is related to a two-particle covariance function in a homogeneous and stationary field of turbulence. A simple working approximation is suggested for the determination of this covariance function in terms of entirely Eulerian fields. Simple expressions are derived for the growth of the puff's standard deviation for diffusion times that are small compared to the integral time scale of the turbulence.

49848 **Comparison of observed and predicted sodium air and ground concentrations.** Miller, C.W.; Fields, D.E.; Wiseman, P.J. (Oak Ridge National Laboratory, Oak Ridge, TN 37830). *Transactions of the American Nuclear Society;* **43**: 81-82(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

49849 **Accident generated aerosols: assessment methodology.** Sutter, S.L.; Ballinger, M.Y.; Bander, T.J.; Chan, M.K.; Owczarski, P.C. (Battelle-Pacific Northwest Laboratory, P.O. Box 999, Richland, WA 99352). *Transactions of the American Nuclear Society;* **43**: 78(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

49850 **Simulation of wind field in complex terrain.** Ichikawa, Y.; Shikata, H. (CRIEPI, 2-11-1 Iwato Kita, Komae-shi, Tokyo, 201). *Transactions of the American Nuclear Society;* **43**: 79-80(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

49851 **Simulation of short-term fluctuation in gamma exposure rate.** Ichikawa, Y.; Ishida, K.; Shikata, H. (CRIEPI, 2-11-1 Iwato Kita, Komae-shi, Tokyo, 201). *Transactions of the American Nuclear Society;* **43**: 80-81(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

49852 **Air transport in connection with the Hiroshima Nagasaki dose reevaluation effort.** Estes, G.P.; Little, R.C.; Seamon, R.E.; Soran, P.D. (Los Alamos National Laboratory, P.O. Box 1663, Los Alamos, NM 87545). *Transactions of the American Nuclear Society;* **43**: 637-638(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

5005 Site Resource And Use Studies

49853 **(LBL—16214) Geographic and statistical analysis of air-quality data in the United States.** Johnson, L.D. (Lawrence Berkeley Lab., CA (USA)). 3 Jun 1983. Contract AC03-76SF00098. 176p. NTIS, PC A09/MF A01. Order Number DE83016471.

Portions are illegible in microfiche products; Thesis.

This dissertation contains the development and the application of analytic procedures for examining and exploring some air-quality data collected by the Environmental Protction Agency from 1974 through 1976. They are collected at monitoring stations most of which are in metropolitan areas. These data are irregularly distributed discrete-point measurements. The techniques explored here may be useful in other disciplines with the same type of data. The analysis concentrates on suspended particulates and sulfur dioxide because of data availability and the current interest to the health field. Ohio is chosen as an example because it is the most thoroughly monitored state in the US. Interpolation schemes are explored and a two-dimensional analogue of the moving average model in time series is presented. Comparison to Akima's method of bivariate linear interpolation is made. Also, contour maps using each method are drawn and compared. Advantages and disadvantages for comparing cross-validation estimates are discussed. How different goals may prescribe different estimation techniques is discussed.

5006 Regulations

REFER ALSO TO CITATION(S) 49261, 49830, 49908, 50071

49854 **(AD-A—125460/6) Development of a permitting strategy for a coal-fired heating plant, K.I. Sawyer AFB, Maine. Final report for period ending Sep 82.** (Engineering Science, Inc., Fairfax, VA (USA)). Dec 1982. 160p. NTIS, PC A08/MF A01.

This report develops air pollution design criteria and a corresponding permitting strategy for a candidate coal-fired heating plant. The optimum strategy and fallback strategies are supported by the appropriate calculations and air quality analyses.

49855 **(PB—83-192385) Background information document proposed standards for radionuclides. Draft report.** (Office of Radiation Programs, Washington, DC (USA)). Mar 1983. 390p. (EPA—520/1-83-001). NTIS, PC A17/MF A01.

This report presents background information that supports the Environmental Protection Agency's (EPA's) proposed emission standards for radionuclides pursuant to Section 112 of the Clean Air Act. An analysis of public health impacts from the following source categories is presented: (1) Department of Energy (DOE) facilities, (2) Nuclear Regulatory Commission (NRC)-licensed and non-DOE Federal facilities, (3) coal-fired utility and industrial boilers, (4) uranium mines, (5) phosphate industry facilities, and (6) mineral extraction industry facilities. For each source category, the following information is presented: (1) a general description of the source category, (2) a brief description of the processes that lead to the emission of radionuclides into air, (3) a summary of emissions data, and (4) estimates of radiation doses and health risks to both individuals and populations.

51 ENVIRONMENTAL SCIENCES, TERRESTRIAL

5101 Basic Studies

REFER ALSO TO CITATION(S) 49825

5102 Chemicals Monitoring And Transport

49856 **(IAEA-R—2185-F) Measurement and prediction of soil biological processes resulting in denitrification. Part of a coordinated programme on isotopic tracer-aided studies of agrochemical residue - soil biota interactions. Final report for the period 1 April 1978 - 30 November 1982.** Rolston, D.E. (International Atomic Energy Agency, Vienna (Austria)). Aug 1982. 24p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83701483.

The water soluble carbon from soil extracts was taken from a two hundred point grid established on a 1.2 ha field. The sampling was in the fall after the harvest of a sorghum crop. The concentrations ranged from 23.8 ppm to 274.2 ppm. Over 90 per cent of the concentrations were grouped around the mean of 40.3 ppm. The higher values caused the distribution to be greatly skewed such that neither normal nor log normal distributions characterized the data very well. The moisture content from the same samples followed normal distribution. Changes in the mean, the variance and the distribution of water soluble carbon were followed on 0.4 ha of the 1.2 ha in a grid of sixty points during a crop of wheat and a subsequent crop of sorghum. The mean increased in the spring, decreased in the summer and increased again in the fall. The spring and summer concentrations are well characterized by log normal

distributions. The spatial dependence of water soluble carbon was examined on a fifty-five point transect across the field spaced every 1.37m. The variogram indicated little or no dependence at this spacing.

49857 **(ORNL/CSD—115) Confidence limits for the expectation of a Poisson variable: figures and tables.** Bowman, K.O.; Leach, E. (Oak Ridge National Lab., TN (USA)). Jul 1983. Contract W-7405-ENG-26. 61p. NTIS, PC A04/MF A01. Order Number DE83016329.

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An enriched uranium recovery facility within the Y-12 Plant (operated by Union Carbide's Nuclear Division for the US Department of Energy) uses water as a coolant for several heat exchangers containing enriched uranium solutions. A leak in the condenser could allow uranium solutions to enter New Hope Pond located at the eastern perimeter of the plant. A sodium iodide scintillation detector is used to monitor the efferent water leaving the facility. The limit of detectability for uranium in the stream is limited by the background within the shielded detector chamber. The response of the detector to calibrated standards is shown. As can be noted at zero concentration, a 390 count background is obtained during the 100 second sampling period. A false alarm rate of one per month is sought, so determination of the minimum concentration detectable with this constraint is a problem of statistical analysis in which background and false alarm rate determine sensitivity. This report describes the analysis used to calculate the sensitivity.

49858 **(SKBF-KBS-TR—81-12) Ion diffusion in compacted sodium and calcium bentonites.** Eriksen, T.E.; Jacobsson, A. (Svensk Kaernbraenslefoersoerjning AB, Stockholm). Feb 1982. 21p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83701473.

The diffusivities of Sr^{2+} and Cs^{+} in compacted Erbsloeh Ca-bentonite and Mx-80 Na-bentonite have been determined by various tracer techniques. Whereas the diffusivity of Sr^{2+} was found to be $(1,5(2))x10^{-11}m^{2}xsec^{-1}$ in both bentonites the diffusivity of Cs^{+} was found to be $(7(2))x10^{-12}$ and $(2,5(5))x10^{-12}m^{2}xsec^{-1}$ in erbsloeh and Mx-80 respectively. A comparison of the diffusivities of Sr^{2+} and Cs^{+} with the diffusivities of Cl^{-} and I^{-} earlier obtained shows that high Ksub (d)-values are not necessarily an indication of immobilization i.e. a simple pore diffusion model with retardation of the diffusing ions by sorption processes is not valid for Sr^{2+} and Cs^{+}. Water ratio (density) and homogenization time were not found to have any measurable effect on the diffusivity of the cations.

5103 Radioactive Materials Monitoring And Transport

REFER ALSO TO CITATION(S) 48672, 48690, 48702, 48735, 48737, 48738, 49842, 50036

49859 **(DOE/NE/44139—T1) 1982 environmental-monitoring program report for the West Valley Demonstration Project site.** (West Valley Nuclear Services Co., Inc., West Valley, NY (USA)). May 1983. Contract AC07-81NE44139. 33p. NTIS, PC A03/MF A01. Order Number DE83013032.

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This report is prepared and submitted in accordance with the requirements of DOE Order 5484.1 and presents environmental monitoring program data collected at the West Valley Demonstration Project (WVDP) site from February 26, 1982, through December 31, 1982. The WVDP objective is to solidify approximately 600,000 gallons of high-level liquid radioactive waste stored at the former Nuclear Fuel Services reprocessing facility at West Valley, New York. Nuclear Fuel Services conducted an environmental monitoring program in accordance with Nuclear Regulatory Commission requirements which were appropriate for shutdown maintenance operations conducted at the site. That program was embraced by West Valley Nuclear Services Company (WVNS) at the time of transition (February 26, 1982) and will be modified to provide a comprehensive monitoring program in preparation for waste solidification operations scheduled for startup in June 1988. As such, the data presented in this report is considered preoperational in nature in accordance with DOE Order 5484.1, Chapter III, Paragraph 1. The environmental monitoring program planned for the operating phase of the project will be fully implemented by fiscal year 1985 and will provide at least two years of preoperational data prior to startup.

49860 **(JAERI-M—82-021) Isopleths of surface concentration and surface exposure rate due to a radioactive cloud released from a stack.** Kobayashi, H.; Yabuta, H.; Katagiri, H.; Obata, K.; Kokubu, M. (Japan Atomic Energy Research Inst., Tokyo). Mar 1982. 300p. (In Japanese). NTIS (US Sales Only), PC A13/MF A01. Order Number DE83702411.

Various calculations are made to estimate the distributions of concentration and γ-exposure rate due to a radioactive cloud released from a point source to the atmosphere. In this report, the isopleths of concentration and γ-exposure rate which were calculated are given in graphs to enable rapid prediction of the influence of released radioactive material in the emergency situation. Recently there are facilities which are equipped with a system to display the calculation results on CRT; but such practice is rather rare. By placing the calculated isopleths of reduction scale 1/25000 or 1/50000 on the usual map, any facilities without the CRT system can readily estimate the influence of an accidental release. The graphs of isopleths are given with the release height (11 values of 0 to 200 m at about 20 m intervals) and the atmospheric stability (6 classes) as parameters. Calculations of γ-exposure rates were made using the computer code GAMPUL developed by T. Hayashi and T. Shiraishi. In the calculation of radioactive concentrations and γ-exposure rates, the vertical diffusion depths, σsub(z), exceeding 1000 m are taken to be 1000 m according to the Meteorological Guide for the Safety Analysis of Power Reactor (J.AEC). The comparison between with and without this limitation in σsub(z) is made in the case of downwind axial surface distributions.

49861 **(NRPB-R—134) Environmental radioactivity surveillance programme: results for the UK for 1981.** Fry, F.A.; Dodd, N.J.; Green, N.; Major, R.O.; Wilkins, B.T. (National Radiological Protection Board, Harwell (UK)). Jun 1982. 41p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702313.

The 1981 results of a NRPB report on a UK environmental radioactivity surveillance programme are presented. The concentrations in air of long-lived radionuclides produced by weapons testing were higher than those observed in 1980 due to the intermediate level atmospheric nuclear weapon explosion in Central Asia in October 1980. The concentrations of fission products were the highest observed since 1978; the annual average caesium-137 concentration was three times the value for 1980. The average depositions of strontium-90 and caesium-137 in the UK were also elevated above those in recent years. An average effective dose equivalent commitment of 2 μSv from external irradiation by radionuclides deposited in 1981 added less than 1% to that accumulated from atmospheric nuclear explosions in earlier years. The concentrations of strontium-90 and caesium-137 in milk were higher than that reported for 1980. For a typical adult, the average committed effective dose equivalent attributable to contamination of diet with these radionuclides is estimated to be 4 μSv. The estimate for caesium is consistent with that obtained from direct measurement of this radionuclide in the body. The average annual effective dose equivalent from fallout is evaluated and compared with that from natural background radiation.

49862 **(ORNL/TM—8831) Polonium-210 and lead-210 in food and tobacco products: a review of parameters and an estimate of potential exposure and dose.** Watson, A.P. (Oak Ridge National Lab., TN (USA)). Jul 1983. Contract W-7405-ENG-26. 45p. NTIS, PC A03/MF A01. Order Number DE83016395.

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Food-chain transport of Pb-210 and Po-210 from soil to edible plant parts and from animal feed to meat and milk were evaluated from a review of literature. The degree of transfer was characterized by estimating concentration factors (unweighted arithmetic means) as well as the transfer coefficients B/sub v/, B/sub r/ (unweighted geometric means, f/sub m/ and f/sub f/ (unweighted arithmetic means). Global dietary intake of Pb-210 and Po-210 was

also summarized, and 50-year dose estimates to target organs calculated. The greatest estimated ingestion doses were those to populations with large dietary complements of animal protein in the form of seafood (Japan) or caribou/reindeer muscle and organ meats (Arctic Eskimos and Lapps). The magnitude of this latter source illustrates the importance of simple food chains in generating significant exposures to populations dependent upon them. The origin and magnitude of inhalation exposure and dose from tobacco products was also assessed. For the majority of internal organs evaluated, the dose resulting from smoking commercially available tobacco products is comparable to or greater than the dose estimates for ingestion of naturally occurring dietary Pb-210 and Po-210.

49863 **(PB—83-201285) Radioactive fallout from nuclear weapons: a review of airborn transport, effects and measures).** Bergman, R.; Lindqvist, S.; Johansson, L.; Schelin, O.; Lagerstedt, O. (Foersvarets Forskningsanstalt, Sundbyberg (Sweden)). Feb 1983. 203p. NTIS, PC E10/MF E01.

This study concerns the state of the art of radioactive fallout problems in Sweden. Consequences of various fallout situations for the Swedish population are stressed, and information directed towards authorities involved in the planning for protective actions is given. The study emphasizes fallout caused by nuclear explosions outside Swedish territory, i.e. when Sweden is not directly involved in a nuclear war. Distribution and properties of fallout fields are described. Radiation effects on man from external sources as well as internal sources (food-intake, inhalation etc) are considered. In addition consequences for agriculture and food production are investigated. Some radiation-sensitive new materials such as modern electronic components are discussed as well as a number of possible protective actions.

49864 **(RISO-R—470) Environmental radioactivity in the Faroes in 1981.** Aarkrog, A.; Dahlgaard, H.; Lippert, J.; Hallstadius, L.; Holm, E. (Risoe National Lab., Roskilde (Denmark)). Jul 1982. 54p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702405.

Measurements of fallout radioactivity in the Faroes in 1981 are presented. Strontium-90 (and ^{137}Cs in most cases) was determined in regularly collected samples of precipitation, grass, milk, fish, sea water, bread and drinking water. In addition, analyses were made of spot samples of lamb, sea birds, potatoes, sea plants, vegetables, eggs, and human bone. Estimates are given of the mean contents of ^{90}Sr and ^{137}Cs in the human diet in the Faroes in 1981. In Appendix the results from samplings of sea water and biota along the Icelandic and the Norwegian coasts are given.

49865 **(RISO-R—471) Environmental radioactivity in Greenland in 1981.** Aarkrog, A.; Dahlgaard, H.; Hansen, H.; Lippert, J.; Nilsson, K.; Holm, E. (Risoe National Lab., Roskilde (Denmark)). Jul 1982. 44p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702406.

Measurements of fallout radioactivity in Greenland in 1981 are reported. Strontium-90 (and Cesium-137 in most cases) was determined in samples of precipitation, sea water, vegetation, animals, and drinking water. Estimates are given of the mean contents of ^{90}Sr and ^{137}Cs in the human diet in Greenland in 1981. Further results of the $^{239,240}Pu$ and ^{241}Am measurements on samples from the expedition to Thule in August 1979 are prsented. Brown algae collected in East Greenland in 1969 were analysed for Pu and Am.

5105 Site Resource And Use Studies

REFER ALSO TO CITATION(S) 48680, 48706, 48711, 48712, 48713, 48714, 48717, 48720, 48743, 48958, 50092, 50093

49866 **(CONF-830781—1) CEREAS: a computerized mapping system for environmental reviews.** Snider, M.A.; Levenson, J.B. (Argonne National Lab., IL (USA)). 1983. Contract W-31-109-ENG-38. 23p. NTIS, PC A02/MF A01. Order Number DE83015718.

From Harvard computer graphics conference; Cambridge, MA, USA (27 Jul 1983).

The overthrust belt of the Rocky Mountain states has recently been the focus of intense oil and natural gas exploration and development. Exploration and drilling activities occur largely on leased federal lands, where the federal surface management agencies are responsible for determining potential environmental impacts. CEREAS was developed to provide environmental scientists immediate access to computer-drawn maps indicating potential constraint areas in relation to proposed activity sites. The environmental scientist specifies the activity site coordinates, map scale and data theme. The system retrieves the data surrounding the proposed activity site and spatially portrays the data on an online or offline graphics device. The CEREAS system comprises three basic parts - a generalized mapping system, a system of map data bases, and an input command processor. The generalized mapping system is a general-purpose program that performs basic mapping functions necessary to draw maps from digitized spatial data. The data base system contains spatial environmental data for areas of intense oil and gas activities. The command processor provides an interface among the operator of the system, the mapping program, and the data bases.

5106 Regulations

REFER ALSO TO CITATION(S) 48958, 49843, 49859, 49908, 49909

49867 **(ORNL/TM—9017) Case studies: developing land uses in surface-mine reclamation.** Seddon, J.; Petrich, C. (Carl Mays, Corkill and Seddon, Inc., New York (USA); Oak Ridge National Lab., TN (USA)). Jun 1983. Contract W-7405-ENG-26. 72p. (OSM/TR—1-83). NTIS, PC A04/MF A01. Order Number DE83016392.

Regulations adopted in 1978 by the Office of Surface Mining (OSM) to implement the Surface Mining Control and Reclamation Act of 1977 foreclosed many opportunities for development of postmining uses because of the requirement to return land to its approximate original contour (AOC), and the difficulty of qualifying for a variance. The regulations all but eliminated development of postmining uses with economic or community benefits. The effect of those regulations was to develop forestland, farmland, and rangeland similar to that which existed before mining. Recent changes in OSM's regulations have made development of postmining uses more feasible by removing many restrictive conditions and interpretations. This report documents the main types of uses that have been developed as postmining uses - recreation, forestry, housing, community facilities, industry, and commercial and mixed urban uses. Most of the cases presented predate the Act, and thus were not developed in a regulatory situation comparable to the present time. However, they demonstrate the practical feasibility and the benefits to local communities of developing postmining uses. The review of examples and case studies leads to three main conclusions: in certain situations surface-mined land may be an important resource for communities; most successful postmining developments required considerable vision and dedicated effort over many years; and an intended postmining use should be studied and planned during the preparation of mining permits so that the mining operation can be coordinated with the postmining use.

52 ENVIRONMENTAL SCIENCES, AQUATIC

5201 Basic Studies

REFER ALSO TO CITATION(S) 49825, 49996

49868 **(AD-A—125794/8) Recording fathometer techniques for hydrilla distribution and biomass studies. Final report.** Shireman, J.V.; Maceina, M.J. (Florida Univ., Gainesville (USA). Aquatic Plants Research Center). Jan 1983. 61p. NTIS, PC A04/MF A01.

49869 **(PB—83-179697) Wind effects on longitudinal dispersion in open-channel flows. Final report.** Mergenthaler, A.M.; Wu, J. (Delaware Univ., Newark (USA). Coll. of Marine Studies; Maryland Dept. of Natural Resources, Annapolis (USA). Power Plant Siting Program). Dec 1982. 52p. NTIS, PC A04/MF A01.

The effects of wind on the longitudinal dispersion has been studied experimentally in a flume. The study includes the wind effects on open-channel flows, calculation of the dispersion coefficients using flow parameters and determination of the dispersion coefficient from dye tracers. The results generally confirm the theoretical estimate with a decreasing dispersion coefficient under upstream wind conditions and increasing under the downstream wind conditions.

5202 Chemicals Monitoring And Transport

REFER ALSO TO CITATION(S) 48540, 48543, 48548, 48618, 49570, 50068

49670 **(AD-A—127791/2) Frequency and distribution of natural and pollutant organic sea slicks. Memorandum report.** Garrett, W.D. (Naval Research Lab., Washington, DC (USA)). 29 Apr 1983. 29p. (NRL-MR—5075). NTIS, PC A03/MF A01.

Organic sea surface films, both natural and pollutant, modify numerous physical, chemical and biological processes at the air-sea interface. Physical and hydrodynamic effects caused by such surface films influence the signals received by both active and passive remote sensing systems. Thus, knowledge of the frequency and distribution of organic slicks is essential to identify ocean regions where oil and natural organic films are prevalent, especially when remotely sensed data from such areas are to be interpreted. The most influential factors which influence the existence and persistence of natural films at sea include wind velocity and oceanic primary productivity. Global charts of these parameters are presented, and the seasonal variabilities are discussed. The distribution of pollutant petroleum slicks is based on results of a United Nations marine pollution monitoring project, and figures of both global and regional oil spill data are included. In general, natural slicks are mostly likely in biologically rich coastal areas under relatively calm conditions, although visible slicks can occur at any oceanic location if winds are sufficiently calm. Petroleum slicks are most prevalent in regions affected by significant oil tanker and shipping activity. High wind-wave dynamics reduce the probability of the existence of both natural and pollutant films, and such conditions predominate over strong source strengths of the film-forming material in determining the likelihood of slick formation and persistence.

49671 **(CONF-820794—1) Role of the oceans in the carbon cycle.** Baes, C.F. Jr. (Oak Ridge National Lab., TN (USA)). 1982. Contract W-7405-ENG-26. 37p. NTIS, PC A03/MF A01. Order Number DE83015530.

From Conference on climate and energy: carbon dioxide; Erice, Italy (16 Jul 1982).

Purpose of this paper is first to review the physical, chemical and biological processes that will determine the rate of CO_2 takeup by the oceans. It is shown how these processes determine the distribution of carbon between the ocean and atmosphere, and in the oceans themselves. Finally it is considered to what extent these processes should be represented in models intended to simulate the response of the oceans to increasing atmospheric CO_2.

49672 **(CONF-8208123—) International conference on coal fired power plants and the aquatic environment.** (Vandkvalitetsinstituttet, Hoersholm (Denmark)). 1982. 679p. NTIS (US Sales Only), PC A99/MF A01. Order Number DE83770145.

From International conference on coal fired power plants and the aquatic environment; Copenhagen, Denmark (16 Aug 1982).

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Individual papers are included in the datas.

49673 **(CONF-8306107—1) Fates of Aromatics Model (FOAM): description, application, and analysis.** Bartell, S.M.; Gardner, R.H.; O'Neill, R.V. (Oak Ridge National Lab., TN (USA)). 1983. Contract W-7405-ENG-26. 14p. NTIS, PC A02/MF A01. Order Number DE83015519.

From International Society for Ecological Modeling (ISEM) conference on modelling the fate and effect of toxic substances in the environment; Copenhagen, Denmark (6 Jun 1983).

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This report describes a model developed to simulate the fate of individual PAH's in aquatic systems, summarizes current applications of the model, evaluates its precision for forecasting, and outlines future requirements for refinement of the model. The hypothesis is that the fate of PAH's can be forecast from fundemental, easily measured chemical characteristics of individual compounds. FOAM was implemented to forecast the transport and accumulation of anthracene in artificial streams. Molecular weight, melting point, octanol:water partition coefficient, and light absorption spectrum are descriptors that correlate with rate of processes that determine the fate of individual PAH's in aquatic systems. Results of the model evaluation, analyzed at several levels of component aggregation, demonstrate that the utility of FOAM for forecasting transport and accumulation of PAH's is a function of the required resolution of the forecasts. Predictions of time-varying anthracene concentrations in individual system components ranged in their precision over two orders of magnitude. Predictions of the relative distribution among water, sediments, and biota were more precise than estimates of anthracene in individual components. Models in the research phase at detailed levels of resolution might be sufficiently robust to forecast toxicant fate at more aggregated levels of system description. (DMC)

49674 **(IAEA-R—1724-F) Integrated study of labelled contaminant or substrate-biological species interactions in a selected aquatic ecosystem. Part of a coordinated programme on isotopic-tracer aided research and monitoring on agricultural residue - biological interactions in aquatic ecosystems. Final report for the period 1 July 1976 - 30 June 1982.** Perry, A.S. (International Atomic Energy Agency, Vienna (Austria)). Jun 1982. 26p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83701482.

Repetitive exposure of a eutrophic fish pond ecosystem, enclosed in limnocorrals to 30 ppb parathion resulted in elimination of the potentially dominant zooplankton species, Moina micrura. Consequently, the populations of the rotifers Brachionus and Asplanchna markedly increased. Changes in the zooplankton composition and abundance were followed by increased fluctuations in phytoplankton biomass, phytoplankton photosynthesis, plankton respiration and community metabolism. Similar responses to parathion treatment were observed in previous studies under fish pond conditions. In the presence of fish the effect of parathion on the ecosystem was generally less pronounced and not uniform. The collapse of the zooplankton community and the rapid changes in limnological conditions in the control (untreated) limnocorrals severely limited the duration of the experiment. The results suggest that under eutrophic conditions, small enclosures may be useful for evaluation of the effect of toxicants on the ecosystem only in short term experiments with short liver chemicals.

49675 **(JAERI-M—9908) Development of coastal diffusion observation method with a model airplane.** Yamada, M.; Fukuda, M. (Japan Atomic Energy Research Inst., Tokyo). Jan 1982. 16p. (In Japanese). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702414.

A tethered ballon system has been developed in order to take aerial photographs of dye-clouds in times of coastal diffusion experiment. The system has some weakpoints; it can not be used both under strong wind and under on-shore blowing wind. To cover these wind conditions, another method of aerial photography is developed making use of model airplane. A radio controlled airplane on the market is reconstructed to mount 35 mm camera, the shutter of which is handled through the channel ordinarily used to control wheel logs. The procedure of the new system in case of diffusion experiment is similar to that of the tethered balloon system. Observations with this system have been carried out from winter to summer this year. Some results of them are described.

49876 **(NUREG/CR—3410) CHMONE: a one-dimensional computer code for simulating temperature, flow, and chemical concentrations in water bodies.** Fischer, S.K.; Eraslan, A.H.; Hetrick, D.M.; Kim, K.H.; Lietzke, M.H.; Patterson, M.R. (Oak Ridge National Lab., TN (USA)). Jul 1983. Contract W-7405-ENG-26. 255p. (ORNL/TM—8786). NTIS, PC A12/MF A01 - GPO. Order Number DE83016824.

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The computer code CHMONE simulates fast-transient, one-dimensional hydrodynamic, thermal, and chemical-species-concentration conditions in controlled rivers and tidal estuaries. The code is particularly designed for applications to actual site-specific problems that require accurate predictions of the chemical species concentrations for preliminary studies of the aggregate chemical impact on a common waterbody caused by chlorination of the discharge water from multiple power plant operations. The CHMONE code can continuously simulate the hydrodynamic and thermal conditions and concentrations of four chemical species for a 30-d period. Because only a small amount of CPU time is necessary, CHMONE can be readily utilized as a cost-effective tool in studying thermal and chemical impacts of power plant discharges in controlled rivers and tidal estuaries.

49877 **(PB—83-192955) Colorado cooperative fishery research unit studies at Twin Lakes, Colorado: 1980 report of findings.** Bergersen, E.P.; Maiolie, M. (Colorado State Univ., Fort Collins (USA). Colorado Cooperative Fishery Research Unit; Bureau of Reclamation, Denver, CO (USA). Engineering and Research Center). Dec 1981. 66p. NTIS, PC A04/MF A01.

The objectives of these investigations were to gather baseline data on the Twin Lakes system during the preoperational phase of the Mt. Elbert Pumped-Storage Powerplant, and to develop aquatic environmental monitoring techniques suitable for use during postconstruction operating periods. The five areas investigated were chosen specifically to fill gaps in present knowledge of the two-lake system, test methodologies, and point out monitoring problems which might be encountered during the operational phase of the project.

49878 **(RFP-Trans—409) Removal of nitrates from groundwater by reverse osmosis.** Rautenbach, R.; Henne, K.H. (Rockwell International Corp., Golden, CO (USA). Rocky Flats Plant; Technische Hochschule Aachen (Germany, F.R.)). Aug 1983. Contract AC04-76DP03533. Translation of BMFT-FB-T 80-155, December 1980. 49p. NTIS, PC A03/MF A01. Order Number DE83016805.

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A hybrid process is presented permitting the reduction of nitrate content of ground water to the allowable limit (≦ 50 ppM) while simultaneously reducing the total salt content and the discharge of the concentrated brine. Design data were determined for a pilot plant (18 m^3/hr potable water) and for a large-scale plant (360 m^3/hr), and the specific potable-water production costs to be expected for the discussed concepts are provided. 19 references. (ACR)

5203 Radioactive Materials Monitoring And Transport

REFER ALSO TO CITATION(S) 48681, 48721, 48729, 48735, 48736, 49841, 49843, 49864, 49865

49879 **(CEGB-TPRD/B—0058/N82) Calculation of collective radiation exposure arising from discharges of activity into an estuary or sea in the British Isles.** Maul, P.R. (Central Electricity Generating Board, Berkeley (UK). Berkeley Nuclear Labs.). Apr 1982. 11p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83701472.

A model is described for the calculation of collective radiation exposure for releases of activity to an estuary or sea. The model is based on methods described by the CEC with the main exposure pathways being via the ingestion of seafood and external exposure on beaches. For tritium the most important pathway arises from the transfer of activity from the marine to the atmospheric environment. The model is best suited for calculations for fairly long-lived nuclides which do not become dispersed globally and for which the seafood ingestion pathway is dominant. Dose calculations for short-lived nuclides or nuclides where the external exposure pathway can be important will have greater uncertainty associated with them. A computer code CODAR is being developed which incorporates this model.

49880 **(IAEA-R—1938-F) Comparative study of the N metabolism of phytoplankton and periphyton communities in oligotrophic lakes. Part of a coordinated programme on isotopic-tracer-aided research and monitoring on agricultural residue - biological interactions in aquatic ecosystems. Final report for the period 1 July 1977 - 30 June 1982.** Goldman, C.R. (International Atomic Energy Agency, Vienna (Austria)). Aug 1982. 15p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702317.

Limnological research at Castle Lake, CA, and Lake Tahoe, CA-NEV, USA, during the period 1977-1982 has emphasized the effects of nutrient enrichment and deficiency on primary producers. The low ambient pools of nitrogenous nutrients and their low rates of transformation have necessitated the use of isotope tracer methods (^{14}C, ^{15}N, ^{13}N). These techniques have been used in concert with physiological assays, growth bio-assays, and whole-ecosystem nitrogen enrichments. Our most significant results, to date, include: (1) Delineation of 5 algal communities which are spatially distinct yet occur in the same lake and which differ with regard to their principal sources of N; (2) Determination of the relative affinities of the above communities for the various sources of N; (3) Demonstration of the importance of internally regenerated N to phytoplankton productivity; (4) Development of sensitive methodology to utilize the short-lived radioisotope ^{13}N (t1/2=10 mins) for studies of denitrification and nitrate uptake in aquatic ecosystems; (5) Comparisons of a variety of physiological assays for N-deficiency in aquatic microorganisms, involving short-term and long-term experiments in containers and in an N-enriched lake.

49881 **(IAEA-TECDOC—265) Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981.** (International Atomic Energy Agency, Vienna (Austria)). Jun 1982. 178p. NTIS (US Sales Only), PC A09/MF A01. Order Number DE83780705.

Individual items are included in the data base. (PSB)

49882 (IAEA-TECDOC—265, pp 11-20) **Intercalibration of transuranic measurements.** Fukai, R.; Ballestra, S.; Thein, M. (International Atomic Energy Agency, Monaco-Ville (Monaco). Lab. of Marine Radioactivity). Jun 1982. NTIS (US Sales Only), PC A09/MF A01.

In Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981.

One of the major objectives of the coordinated research programme on Transuranic Cycling Behaviour in the Marine Environment has been to achieve the comparability of the measurement results among the laboratories from different countries participating in the programme. In order to fulfil this objective, the intercalibration exercises of transuranic measurements using sea water and sediment samples were organized by the Monaco Laboratory within the duration of the programme in 1979-1981. The sediment and sea water samples were collected respectively by the Bhabha Atomic Research Centre of India and the Hydrographic Institute of the Federal Republic of Germany. In the present report the results of these intercalibration exercises are surveyed.

49883 (IAEA-TECDOC—265, pp 23-32) **Studies on the distribution of transuranics in the Baltic Sea, the Danish Belts, the Kattegat and the North Sea.** Aarkrog, A.; Dahlgaard, H.; Nilsson, K. (Risoe National Lab., Roskilde (Denmark)). Jun 1982. NTIS (US Sales Only), PC A09/MF A01.

In Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981.

The Danish Sounds and Belts connect the North Sea with the Baltic Sea. The salinity of the North Sea is approximately 34

per mille and of the Baltic approximately 9 per mille. In the inner Danish waters the bottom water consists mostly of ingoing, heavy North Sea water, while on the surface we find the low salinity Baltic water. The Danish waters make it possible within a limited area to study the influence on radionuclide levels of the varying salinities in the marine environment. The Thule samples referred to in the present report do not include those which were contaminated by unexploded nuclear weapon debris from the 1968 accident. The study of transuranics in Danish waters has been supported by the International Atomic Energy Agency (IAEA) since 1978.

49884 (IAEA-TECDOC—265, pp 33-44) **Studies on distribution of actinides between seawater and particulate fractions in the Baltic Sea and its Gulfs.** Miettinen, J.K.; Leskinen, S.; Jaakkola, T. (Helsinki Univ. (Finland). Dept. of Radiochemistry). Jun 1982. NTIS (US Sales Only), PC A09/MF A01.

In Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981.

This paper presents the results of measurements of sup(239,240)Pu and ^{241}Am on a series of samples collected from the Gulf of Finland, the northern Baltic Proper and the Gulf of Bothnia in 1980.

49885 (IAEA-TECDOC—265, pp 45-46) **Transuranic cycling behaviour in marine environment.** Belot, Y.; Germain, P. (CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Dept. de Protection). Jun 1982. NTIS (US Sales Only), PC A09/MF A01.

In Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981.

During the last three years, current programme attention was focused on the behaviour of transuranics at the water-sediment and water-atmosphere interfaces. The objectives of this research were: (i) to learn more of the potential pathways back to man; (ii) to provide an input to the numerical models for estimating doses from short-term or long-term releases. This paper is a report of some of the most significant results and conclusions from the activities of the past three years.

49886 (IAEA-TECDOC—265, pp 47-54) **Distribution of transuranic isotopes in the water of the North Sea and adjacent regions.** Kautsky, H.; Eicke, H.F. (Deutsches Hydrographisches Inst. (DHI), Hamburg (Germany, F.R.)). Jun 1982. NTIS (US Sales Only), PC A09/MF A01.

In Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981.

During the years 1978 to 1980 large scale investigations were carried out for the determination of transuranics in the Western Baltic Sea, in the Kattegat and Skagerrak, and in the whole of the North Sea including a strip to the West and East of the Orkney and Shetland Islands, as well as in a region between North Cape and Spitzbergen. The measurements in the North Sea region were carried out in order to gain better knowledge about the further spreading and behaviour of transuranic isotopes which are introduced into the sea from nuclear fuel reprocessing plants. As far as the other areas are concerned, measurements are intended to provide basic data to supplement the only very meagre data material available. The isotopes of ^{238}Pu and $^{239+240}$Pu were determined from 60 l unfiltered seawater according to the method of Murray and Statham. Nevertheless, for analysis of ^{241}Am, 200 l of seawater were required owing to the lower concentrations. For that reason, this isotope could be determined in only a limited number of samples taken from particularly interesting regions. The data of 1978 were made known in an earlier report; however, they are now interpreted together with the present results.

49887 (IAEA-TECDOC—265, pp 55-60) **Transuranic cycling behaviour in marine environment.** Danali-Cotsaki, S. (Greek Atomic Energy Commission, Environmental Radioactivity Lab., Attiki). Jun 1982. NTIS (US Sales Only), PC A09/MF A01.

In Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981.

This research was initiated by studying the concentration of Pu in the marine environment around the Greek Peninsula because of its importance as a transuranic element. Several collected samples of sea water have been treated for Pu and counted, but the results are not reported. This is due to the difficulties of a contaminated detector. The sediment reference sample of 0.8 g (SDsub(IV)) was counted for 2700 min. The results are shown in this document.

49888 (IAEA-TECDOC—265, pp 61-82) **Behaviour of transuranic nuclides in coastal environment.** Pillai, K.C.; Mathew, E.; Matkar, V.M.; Dey, N.N.; Abani, M.C.; Chhapgar, B.F.; Mullay, C.D. (Bhabha Atomic Research Centre, Bombay (India). Health Physics Div.). Jun 1982. NTIS (US Sales Only), PC A09/MF A01.

In Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981.

In view of the nuclear technological developments, the potential for contamination of marine environment with transuranic nuclides has increased. In this context it is necessary to know not only the current levels of these artificial nuclides but there is also a need to understand the physico-chemical, biological and geochemical behaviour of transuranics to evaluate their significance in the marine environment. Studies on these aspects have been carried out in the coastal environment of the west coast of India, near Bombay. The results obtained and conclusions drawn from the various investigations carried out are given in this document.

49889 (IAEA-TECDOC—265, pp 83-92) **Presence and distribution of plutonium isotopes in two typical marine systems. Taranto and Venice Gulfs.** Triulzi, C.; Tassi Pelati, L.; Albertazzi, S. (Parma Univ. (Italy). Ist. di Zoologia e Anatomia Comparata); Delle Site, A.; Marchionni, V. (Comitato Nazionale per l'Energia Nucleare, Casaccia (Italy). Centro di Studi Nucleari). Jun 1982. NTIS (US Sales Only), PC A09/MF A01.

In Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981.

In the framework of environmental and radiological researches carried out to define the base line level of natural and artificial radioactivity in the Taranto Gulf (Ionian Sea) and in the Venice Gulf (Northern Adriatic Sea), the Radioecology Laboratory of the Zoology Institute has recently developed and is still developing together with researches of CNEN, an investigation on the $^{239+240}$Pu and ^{238}Pu contents in different marine samples. This paper reports the results obtained on a set of environmental samples (water, plankton, organisms and sediments) collected during different cruises from 1972 to 1979 in such marine areas as well as in other stations around the Italian coasts.

49890 (IAEA-TECDOC—265, pp 93-100) **Americium-241, plutonium-239, 240 and cerium-144 contents in shallow near shore sediment collected at Tokai, Japan.** Kurokawa, Y.; Yamato, A. (Power Reactor and Nuclear Fuel Development Corp., Tokyo (Japan)). Jun 1982. NTIS (US Sales Only), PC A09/MF A01.

In Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981.

49891 (IAEA-TECDOC—265, pp 105-110) **Transuranic cycling behaviour in marine environment.** Holm, E.; Persson, B. (Lund Univ. (Sweden). Radiofysiska Institutionen). Jun 1982. NTIS (US Sales Only), PC A09/MF A01.

In Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981.

A summary of the following activities is given: 1. Development of methods for the radiochemical separation and measurements of actinides. 2. Determination of transuranium elements in the Mediterranean Sea. 3. Distribution of transuranium elements in

the Baltic Sea. 4. Determination of transuranium elements in the Arctic.

49892 (IAEA-TECDOC—265, pp 111-119) **Artificial radionuclides in the coastal zone of Southern Scotland.** Mackenzie, A.B.; Scott, R.D. (Scottish Universities Research and Reactor Centre, Glasgow (UK)). Jun 1982. NTIS (US Sales Only), PC A09/MF A01.

In Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981.

Concentrations of plutonium and radiocaesium in sediments and soils from the coastal zone of Southern Scotland have been studied over a period of 18 months. The project has two specific objectives, namely: (i) To assess the magnitude of any onshore transfer of artificial radionuclides; and (ii) To study the post-depositional behaviour of artificial radionuclides in intertidal sediments. Vertical profiles of intertidal sediments, beach sands and coastal soils have been collected from the locations shown in Figure 1, with a regular six monthly sampling programme having been established for Skyreburn Bay intertidal sediments. Cores of marine sediment have also been collected from Loch Etive on the west coast of Scotland. It is well established that concentrations of artificial radionuclides in the marine environment around the west coast of the British Isles are dominated by releases from Windscale Nuclear Fuel reprocessing activities. In addition, concentrations around the east coast are increasing in response to temporal variations in the Windscale discharge pattern. Attempts have been made in the present study to relate observed concentrations of artificial radionuclides to either discharges from Windscale or atmospheric fallout from weapons testing.

49893 (IAEA-TECDOC—265, pp 121-128) **Transuranic cycling behaviour in marine environment.** Pentreath, R.J.; Jefferies, D.F.; Talbot, J.W.; Lovett, M.B.; Harvey, B.R. (Ministry of Agriculture, Fisheries and Food, Lowestoft (UK). Fisheries Radiobiological Lab.). Jun 1982. NTIS (US Sales Only), PC A09/MF A01.

In Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981.

49894 (IAEA-TECDOC—265, pp 129-155) **Transuranic behaviour in marine environment.** Bowen, V.T. (Woods Hole Oceanographic Institution, MA (USA)). Jun 1982. NTIS (US Sales Only), PC A09/MF A01.

In Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981.

This document summarizes the following specific studies concerning the transuranic behaviour in marine environment: 1. Radionuclides in deep sea amphipods; 2. Actinides, ^{55}Fe and ^{137}Cs in N. Pacific water columns; 3. Vertical profile of artificial radionuclide concentrations in the central Arctic Ocean; 4. Bioturbation and the distributions of fallout radionuclides in Pacific Ocean sediments.

49895 (IAEA-TECDOC—265, pp 157-162) **Behaviour of transuranics in natural waters.** Edgington, D. (Wisconsin Univ., Milwaukee (USA). Center for Great Lakes Studies). Jun 1982. NTIS (US Sales Only), PC A09/MF A01.

In Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981.

49896 (IAEA-TECDOC—265, pp 101-103) **Study on the behaviour of transuranic elements in the marine eco-systems around the Korean peninsula.** Yang, K.R. (Korea Advanced Energy Research Inst., Seoul (Republic of Korea)). Jun 1982. NTIS (US Sales Only), PC A09/MF A01.

In Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981.

49897 (IAEA-TECDOC—265, pp 163-171) **Distribution of transuranic nuclides in Mediterranean ecosystems.** Ballestra, S.; Thein, M.; Fukai, R. (International Atomic Energy Agency, Monaco-Ville (Monaco). Lab. of Marine Radioactivity). Jun 1982. NTIS (US Sales Only), PC A09/MF A01.

In Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981.

For the comprehensive understanding of the behaviour of transuranic elements in the marine environment, the knowledge on the distribution of these elements in various components of marine ecosystems is essential. Since the Mediterranean Sea is considered a sufficiently self-contained system, our approach for studying the processes controlling the transuranic cycling in the sea has been to follow, step by step, the redistribution of plutonium and americium in different components of the marine environment, taking Mediterranean ecosystems as examples. While the studies in the past years have supplied quantitative information on the inputs of plutonium and americium into the Mediterranean from atmospheric fallout and rivers as well as on their behaviour in the Mediterranean water column, only scattered data have been made available so far on the occurrence of the transuranic nuclides in the Mediterranean marine biota or sediments. In order to fill up this information gap, biological and sediment samples were collected from the northwestern Mediterranean region during 1975-1978 for the transuranic measurements. The results of these determinations are given in the present report.

49898 (INIS-mf—8036) **Decree No 66-450 of 20 June 1966 concerning general principles for protection against ionizing radiation.** 30 Jun 1966. 15p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780788.

Published in the French Official Gazette.

The purpose of this Decree is to fix the general radiation protection principles. Its provisions apply to all activities implying exposure to ionizing radiation and, in particular, to the production, processing, handling, use, possession, storage, transport and disposal of radioactive materials. (NEA).

49899 (SKBF-KBS-TR—82-13) **Variation in radioactivity, uranium and radium-226 contents in three radioactive springs and along their out-flows northern Sweden.** Ek, J.; Evans, S.; Ljungqvist, L. (Svensk Kaernbraenslefoersoerjning AB, Stockholm). 3 Jun 1982. 100p. NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702316.

An investigation was performed in three uranium rich springs in northern Sweden with the aim to observe the temporal and spatial variations of uranium and radium within a natural ecosystem in contact with groundwater. The contents of uranium and radium in spring water, peat and sediment together with measurements of stabel elements and environmental data were determined along the furrows during different seasons. There was mostly a disequilibrium between the content of uranium in peat and water. The very high adsorption capacity of peat and its low leaching rate was assumed to be responsible for this discrepancy. The field data were supported by some laboratory experiments. The accumulation by peat was always much higher than the corresponding losses. The effect of freezing seemed not to be of any importance for the leaching rate. However, lowering the pH will highly affect the release of uranium bound to the peat.

5205 Site Resource And Use Studies

REFER ALSO TO CITATION(S) 49996

49900 (PB—83-192963) **Common plankton of Twin Lakes, Colorado.** Lieberman, D.M. (Bureau of Reclamation, Denver, CO (USA). Engineering and Research Center). Feb 1983. 24p. (REC-ERC—82-21). NTIS, PC A02/MF A01.

A series of studies is being performed to evaluate the effects of the Mt. Elbert Pumped-Storage Powerplant on the ecology of Twin Lakes. Twin Lakes are a pair of connected dimictic lakes, formed as the result of glacial action on alluvial deposits. This

report presents a taxonomic species study of the common plankton collected since 1974 from Twin Lakes. A total of 11 zooplankters and 14 phytoplankters were identified from the limnetic zone of Twin Lakes and the associated Mt. Elbert Forebay. The four divisions of zooplankton included four species of Rotifera (rotifer), three species of Copepoda (copepod), three species of Cladocera (cladoceran), and one species of Mysidacea (opossum shrimp).

5206 Regulations

REFER ALSO TO CITATION(S) 49843, 49908

49901 (PB—83-178095) Alternative structures for water rights markets: overview and hypothetical case study. Eheart, J.W.; Lyon, R.M.; Wong, B.D.C. (Illinois Univ., Urbana (USA). Water Resources Center; Office of Water Research and Technology, Washington, DC (USA)). Jan 1983. 79p. (UILU-WRC—83-0174). NTIS, PC A05/MF A01.

Although there has been general interest in the use of systems of transferable water rights to increase efficiency and flexibility of present water allocation systems, there has been relatively little research into the specific details of these market systems. The design of systems of marketable permits for water consumption from natural water courses was examined through a qualitative overview and a quantitative quasi-empirical, quasi-hypothetical case study. The most important considerations of the study were associated with the uncertainty of future streamflows and economic conditions, locational issues, and efficient and effective functioning of the markets.

53 ENVIRONMENTAL-SOCIAL ASPECTS OF ENERGY TECHNOLOGIES

REFER ALSO TO CITATION(S) 49247

5301 Social And Economic Studies

REFER ALSO TO CITATION(S) 48790, 49158, 49159, 49272, 49287, 49832

49902 (INIS-BR—05, pp vp) Significance of safety for Brazilian manufacturing plant's quality assurance. dos Santos, W. (Centro Tecnico Aeroespacial, Sao Jose dos Campos (Brazil)). Jun 1980. NTIS (US Sales Only), PC A21/MF A01. (CONF-8006205—).

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

The deficiency of Brazilian industry related to quality control, is shown. (E.G.).

49903 (INIS-mf—8095) German risk study. Pt. 1. Plant analysis. Heuser, F.W. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 21p. (CONF-8009308—22-Pt.1). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702771.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

With reference to a representative PWR plant of the 1300 MWe-type some 100 accident sequences leading to core melt have been investigated. An overall core melt frequency of about 9 x 10^{-5} per reactor and per year has been obtained as a mean value. According to the analysis performed the main contributions to the core melt frequency result from uncoped small LOCAs in the reactor coolant loops, and some transients (e.g. Loss of Offsite Power). Furtheron, assuming failure of engineered safety features, the course of core melt accidents and potential containment failure modes (overpressure, leakage, steam explosion) are analyzed. Thereby the course of a core melt accident leading to overpressure failure of the containment is discussed in some detail. The activity release in the environment resulting from different accident sequences is determined. (orig./RW).

49904 (INIS-mf—8098) Prospective regional studies: The Rhine Meuse study and the Tennessee Valley study. Bayer, A. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 48p. (CONF-8009308—20). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702761.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

Within the scope of this report two regional studies are presented: - the 'Rhein-Maas-Study' within which the expected radiological impact of the population in the Rhein and Maas basin - which is situated within Central Europe - is assessed on the basis of the planned and forecasted development of nuclear energy in the coming decades. - The 'Tennessee Valley Study' within which the expected radiological impact of the population in the Tennessee-Cumberland basis - which is situated within North America - is assessed likewise on the basis of the planned and forecasted development of nuclear energy in the coming decades.

49905 Haensel and Grethel on the soft energy path. Lyon, W.S. (Oak Ridge National Lab., TN (USA)). *Radiochemical and Radioanalytical Letters;* **55**: No. 5-6, 275-277(4 Mar 1983).

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Ecological 'thinkers' of our time decry high technology including such activities as nuclear power, personal automobiles, chemical fertilizers, pesticides etc. They espouse the 'soft path' which means solar energy, organic farming and wood burning. However, the mankind's greatest problem is how to meet the power demand of the ever growing population of the world. On the 'soft path' it can be solved by the fairy-tale type way only, i.e. burn wood and let your kids get lost.

49906 Tumor induction by small doses ionising radiation. Putten, L.M. van (Gezondheidsorganisatie TNO, Rijswijk (Netherlands). Radiobiologisch Inst. TNO). pp 77 of Radiation hygiene and society: a risk in perspective. Eindhoven, Netherlands; Nederlandse Vereniging voor Stralingshygiene (1981). (In Dutch)

Tumour induction by low radiation doses is in general a non-linear process. However, two exceptions are well known: myeloid leukemia in Rf mice and mamma tumours in Sprague-Dawley rats. The hypothesis that radiation is highly oncogenic in combination with cell growth stimuli, as reaction to massive cell death after damage of nuclear DNA, is applied to man and the consequences are discussed.

49907 Radiation hazards from medical applications. Beekman, Z.M. pp 77 of Radiation hygiene and society: a risk in perspective. Eindhoven, Netherlands; Nederlandse Vereniging voor Stralingshygiene (1981). (In Dutch)

An introduction is presented on the radiation hazards connected with biomedical radiography and nuclear medicine. The frequency of radiodiagnostic efforts was rather high in the Netherlands. This was reduced considerably by abolishing the thorax screening of the population. About diagnostic nuclear medicine less can be said because far fewer numerical data are available. An exposition of genetically and somatically significant doses and how to compute them is given. The drawing up of a profit versus risk evaluation for medical applications of ionizing radiations is recommended. (Auth.).

5302 Assessment Of Energy Technologies

REFER ALSO TO CITATION(S) 48606, 49448

49908 (DOE/EP—0093) Energy technology characterizations handbook: environmental pollution and control factors. Third edition. (Aerospace Corp., Washington, DC (USA); Mueller Associates, Inc., Baltimore, MD (USA)). Mar 1983. Contract AC01-82EP15100;AC01-81EV10450. 1211p. NTIS, PC A99/MF A01. Order Number DE83016339.

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This Handbook deals with environmental characterization information for a range of energy-supply systems and provides supplementary information on environmental controls applicable to a select group of environmentally characterized energy systems. Environmental reziduals, physical-resource requirements, and discussion of applicable standards are the principal information provided. The quantitative and qualitative data provided are useful for evaluating alternative policy and technical strategies and for assessing the environmental impact of facility siting, energy production, and environmental controls.

49909 **(DOE/EP—0098) Environmental compliance guide: guidance manual for Department of Energy compliance with the National Historic Preservation Act.** Sharples, F.E.; Salk, M.S. (Oak Ridge National Lab., TN (USA); USDOE Assistant Secretary for Environmental Protection, Safety and Emergency Preparedness, Washington, DC. Office of Environmental Compliance). Jul 1983. Contract W-7405-ENG-26. 44p. NTIS, PC A03/MF A01. Order Number DE83016114.

This manual provides guidance for Department of Energy(DOE) officials who are responsible for complying with Section 106 of the National Historic Preservation Act of 1966, as amended. This Act requires federal agencies such as DOE to take into account the effects of their undertakings on any historic property that is included in or eligible for inclusion in the National Register of Historic Places. DOE is required to afford the Advisory Council on Historic Preservation an opportunity to comment with regard to the effects of agency projects on historic properties. The commenting process consists of identifying potentially affected properties; determining the nature and magnitude of effects, whether beneficial or adverse; and consulting with the Council to define alternatives that would avoid or mitigate adverse effects. In conducting the consultation process, the Department should seek professional advice and assistance from the State Historical Preservation Officers, the National Park Service, the Advisory Council on Historic Preservation, and other professionals in appropriate fields of specialization.

49910 **(INIS-mf—8103) Operator errors.** Knuefer; Lindauer. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 29p. (CONF-8009308—24). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702774.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

Besides that at spectacular events a combination of component failure and human error is often found. Especially the Rasmussen-Report and the German Risk Assessment Study show for pressurised water reactors that human error must not be underestimated. Although operator errors as a form of human error can never be eliminated entirely, they can be minimized and their effects kept within acceptable limits if a thorough training of personnel is combined with an adequate design of the plant against accidents. Contrary to the investigation of engineering errors, the investigation of human errors has so far been carried out with relatively small budgets. Intensified investigations in this field appear to be a worthwhile effort.

49911 **Risks of power generation.** Mostert, P. (Rijksuniversiteit Utrecht (Netherlands)). pp 77 of Radiation hygiene and society: a risk in perspective. Eindhoven, Netherlands; Nederlandse Vereniging voor Stralingshygiene (1981). (In Dutch)

A comparison is made between the various ways of power generation in the Netherlands and the hazards attached to them. Tables are presented of fuels used, the quantities used per annum and in the course of the last 20 years, accidents and pollution types and percentages, as well as the toxicity and waste disposal risks. (Auth.).

55 BIOMEDICAL SCIENCES, BASIC STUDIES

REFER ALSO TO CITATION(S) 49777, 49778, 49779, 49780

5502 Biochemistry

REFER ALSO TO CITATION(S) 48783, 50002

49912 (IA—1375, pp 190) **Bifunctional agent for protein modification.** Lavie, E.; Abrashkin, S. (Israel Atomic Energy Commission, Tel Aviv); Altman, Y.; Wilchek, M. (Weizmann Inst. of Science, Rehovoth (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49913 (IA—1375, pp 204) **Rapid method for measuring incorporation of radioactive precursors into macromolecules of monolayer cells cultured in microtiter plates. Application to DNA repair synthesis.** Golan, H.; Kol, R.; Ben-Hur, E. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49914 **(INIS-mf—7892) DNA-repair and chromatin. Int. symp. Saalfelden 1981.** Altmann, H.; Klein, G. (Oesterreichisches Forschungszentrum Seibersdorf G.m.b.H. Inst. fuer Biologie). 1982. 156p. (CONF-8108156—). NTIS (US Sales Only), PC A08/MF A01. Order Number DE83780945.

From Symposium on DNA-repair and chromatin; Saalfelden, Austria (30 Aug 1981).

Items within the scope of EDB have been entered individually into the data base. (ACR)

49915 **(JEN—524) Study of the properties of ribulose 1,5 biphosphate carboxilase oxygenase from maize (Zea mays) and wheat (Triticum aestivum) by incorporation of $^{14}CO_2$.** Garcia Pineda, M.D.; Saez Angulo, R.M. (Junta de Energia Nuclear, Madrid (Spain)). 1982. 62p. (In Spanish). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702407.

After a bibliographic review of the properties of RuBP-carboxylase/oxygenase, a methodology is described which allows the treatment of a large number for the counting assay of the enzyme activity. $^{14}CO_2HNa$ is used as a marker for the counting of the incorporated radioactivity as acid insoluble material. $^{14}CO_2$ from the labelled sodium carbonate is the species used by the enzyme both as an activator as well as a substrate. The following experiments are described and its results given: Determination of the optimal conditions for the activation of the enzyme; study of the kinetics of the catalytic action; effect of the Mg^{2+} concentration and determination of the Kmsub((s)) from CO_2 and ribulose 1,5-biphosphate; also determination of the optimun pH at different concentrations of CO_2 and Mg^{2+}.

49916 **(LBL—16341) Structure analysis of OmpC, one of the major proteins in the outer membrane of E. coli, by high resolution electron microscopy.** Chang, C.F. (Lawrence Berkeley Lab., CA (USA)). Jul 1983. Contract AC03-76SF00098. 116p. NTIS, PC A06/MF A01. Order Number DE83016691.

Thesis.

This dissertation is concerned with the structure analysis of a pore-forming membrane protein, OmpC, which is one of the major proteins in the outer membrane of Escherichia coli. In order to obtain structural information it was necessary to develop a suitable technique for preparing two-dimensional crystalline arrays of this membrane protein in an unfixed, unstained and hydrated condition. Electron micrographs were recorded at exposures of less than 5 electrons/A^2 in order to avoid severe radiation damage. The resulting images were crystallographically averaged, in order to overcome the statistical limitations associated with the low electron exposures. The resulting images, which extend to a resolution of ~ 13.5 A, lend themselves to a natural interpretation that is consistent

with the mass density of protein, water and lipid, prior data from 2-D and 3-D structure studies of negatively stained specimens at ≃ 20 A resolution, and published spectroscopic data on the peptide chain secondary structure.

5504 Genetics

REFER ALSO TO CITATION(S) 49927, 49995, 50019

49917 (DOE/EV/10566—6) Mechanisms of mutagenesis-analysis through the use of alcohol dehydrogenase in drosophila. Progress report. Sofer, W.H. (Rutgers--the State Univ., Piscataway, NJ (USA). Waksman Inst. of Microbiology). 1983. Contract AC02-81EV10566. 6p. NTIS, PC A02/MF A01. Order Number DE83016273.

Several chemically induced mutants in the ADH gene have been characterized at the molecular level. We have been able to show that: one EMS induced, ADH negative mutant called CyO/sup nB/, has undergone a single base change - an AT to a GC bp - that results in the appearance of a premature termination codon within the ADH gene; the ADH genes from two other EMS induced mutants have been cloned; all formaldehyde-generated Adh mutants detected to date have turned out to be deletions; four formaldehyde-generated mutants, thought originally to be point mutants, were found, by DNA sequencies, to be small deletions ranging in size from 6 to 34 base pairs (bp) in length; and three of these small deletions were found to occur between two bp direct repeats. One deletion occurred at the base of a quasipalindromic sequence. Two deletions showed additional base changes in sequences adjoining the deleted DNA.

5505 Metabolism

REFER ALSO TO CITATION(S) 49951, 49973, 49999, 50000, 50001, 50064

49918 (DOE/ER/10902—3) Biochemical and physiological characterization of higher plants with reduced photorespiration. Progress report, May 25, 1981-August 1, 1983. Chollet, R. (Nebraska Univ., Lincoln (USA). Dept. of Agricultural Biochemistry). 1983. Contract AC02-81ER10902. 16p. NTIS, PC A02/MF A01. Order Number DE83016122.

Based on work with Moricandia arvensis and Panicum milioides, it is clearly established that a C_4-like CO_2-concentrating system is not the only mechanism by which terrestrial higher plants have reduced photorespiration. Similarly, the lack of any significant involvement of PEP carboxylase in the fixation of either atmospheric or subatmospheric levels of CO_2 argues against some type of PEP carboxylase-mediated recycling of photorespiratory CO_2 in these species. Whether the apparent difference in glycine metabolism for M. arvensis relates directly to the reduction of photorespiration in this crucifer remains to be determined. Likewise, whether the Flaveria genus is presently evolving with respect to the pathway of photosynthetic carbon assimilation and whether a limited degree of C_4 photosynthesis is responsible for the lower Γ-values and reduced rates of photorespiration in the C_3-C_4 intermediate Flaveria species are intriguing, but as yet unanswered questions.

49919 (IAEA-TECDOC—267, pp 7-31) Study of the calcium metabolism of dairy sheep using radioisotope and balance techniques. Economides, S. (Agricultural Research Inst., Nicosia (Cyprus)). Sep 1982. NTIS (US Sales Only), PC A09/MF A01. (CONF-8010327—).

From Research co-ordination meeting on the use of isotope techniques for detection of moderate mineral imbalances in farm animals; Nicosia, Cyprus (6 Oct 1980).

The Ca metabolism of dairy sheep was studied using radioisotope and balance techniques. The level of Ca intake increased the rate of Ca absorption and decreased the efficiency of Ca absorption in dry sheep. The net Ca requirements of dry sheep were estimated at 870 mg/day. The endogenous faecal and urinary Ca losses decreased and the efficiency of Ca absorption increased in pregnant sheep on a Ca-deficient diet compared to pregnant sheep on a normal Ca diet. Ca balance was positive in ewes on both diets. The pre-partum level of Ca intake had a similar effect on the rate and the efficiency of Ca absorption and Ca balance was positive in early lactation. The endogenous faecal Ca loss was linearly related to dry matter intake.

49920 (IAEA-TECDOC—267, pp 33-48) Use of phosphorus-32 in the diagnosis of phosphorus deficiency in sheep. Lobao, A.O.; Vitti Marcondes, D.M.S.S.; Lemos, J.W.; Peixoto Escubedo, M.I.B. (Centro de Energia Nuclear na Agricultura, Piracicaba (Brazil)); de Oliveira, A.A.D. (Instituto de Zootecnia, Nova Odessa (Brazil)); Binnerts, W.T. (Landbouwhogeschool Wageningen (Netherlands)). Sep 1982. NTIS (US Sales Only), PC A09/MF A01. (CONF-8010327—).

From Research co-ordination meeting on the use of isotope techniques for detection of moderate mineral imbalances in farm animals; Nicosia, Cyprus (6 Oct 1980).

Phosphorus deficiency has been recorded in cattle in most states of Brazil and while clinical deficiencies are easily recognised and corrected, subclinical deficiencies often go undetected. The development of a method for the diagnosis of borderline deficiencies would have considerable value since such deficiencies are economically very important. In the experiments reported here, a variety of methods were employed for diagnosing phosphorus deficiency in ruminants, including the uptake of ^{32}P by rumen microorganisms and by erythrocytes. The results show that P deficiency depresses the synthetic capacity of rumen microflora, indicating that ^{32}P uptake might be of some value in the detection of such deficiency. By contrast, the uptake of ^{32}P by erythrocytes was unrelated to P status of the animal.

49921 (IAEA-TECDOC—267, pp 69-90) Problems in the diagnosis of trace element deficiency. Kirchgessner, M.; Schwarz, F.J. (Institut fuer Ernaehrungsphysiologie der Technischen Universitaet Muenchen, Freising (Germany, F.R.)). Sep 1982. NTIS (US Sales Only), PC A09/MF A01. (CONF-8010327—).

From Research co-ordination meeting on the use of isotope techniques for detection of moderate mineral imbalances in farm animals; Nicosia, Cyprus (6 Oct 1980).

This paper reviews current knowledge on the metabolism of trace elements (e.g., zinc, copper and manganese) and describes the problems of diagnosing deficiencies of such elements. At the moment, the most promising and sensitive tests for these elements are the response techniques or functional tests where the animal or its serum is treated with the element under study and the response to this treatment measured. Radioisotopes have particular advantages in such tests, but in the future, the use of stable isotope techniques will become increasingly important.

49922 (IAEA-TECDOC—267, pp 91-100) Effect of selenium deficiency on selenium-75 and calcium-45 metabolism in chicks. Edwardly, J.S. (National Atomic Energy Agency, Jakarta (Indonesia)). Sep 1982. NTIS (US Sales Only), PC A09/MF A01. (CONF-8010327—).

From Research co-ordination meeting on the use of isotope techniques for detection of moderate mineral imbalances in farm animals; Nicosia, Cyprus (6 Oct 1980).

Two hundred 1-day-old broiler chicks were divided into five groups. One group was fed a purified basal diet low in selenium (<0.03 ppm). Three other groups were fed the basal diet supplemented with 0.05, 0.1 or 0.15 ppm Se. The fifth group was fed the basal diet supplemented with 100 IU Vit. E per kg of diet. After three or four weeks on the experimental diets, chicks were given an oral dose of ^{75}Se or ^{45}Ca. Blood and tissue levels of radioisotopes, as well as total body excretion of radioactivity were determined. While body retention of ^{75}Se was significantly higher ($p < 0.05$) in Se deficient chicks than in the supplemented groups, the liver ^{75}Se level was also consistently higher in unsupplemented chicks. Retention of ^{45}Ca was significantly higher in selenium deficient chicks than in supplemented animals. Total Ca concentration in muscle was also higher in this group. Studies of red cell uptake of ^{75}Se demonstrated a clear difference between Se repleted and selenium deficient groups. Selenium deficient chicks demonstrated poor growth of feathers, reduced weight gain and a high mortality compared with the supplemented groups.

49923 (IAEA-TECDOC—267, pp 101-111) **Importance of mineral imbalances in animal production and health and some diagnostic and corrective trials.** Goksoy, K.; Cetinkaya, N.; Gul, F. (Atomenerjisi Komisyonu, Ankara (Turkey)); Orkiz, M.; Gucus, A.I. (Ministry of Agriculture, Lalahan Zootechnique Research Inst., Ankara (Turkey)). Sep 1982. NTIS (US Sales Only), PC A09/MF A01. (CONF-8010327—).

From Research co-ordination meeting on the use of isotope techniques for detection of moderate mineral imbalances in farm animals; Nicosia, Cyprus (6 Oct 1980).

Mineral imbalances of farm animals in Turkey are a limiting factor in animal production and health. Apart from a few severe deficiency syndromes it is assumed that many moderate mineral imbalances (deficiencies and toxicities) exist and are still waiting to be investigated. From this point of view some diagnostic and corrective trials were carried out to develop a system for future application. For this purpose (i) an in vitro red cell radiomineral uptake test was developed. It was found that a modified in vitro red cell radiomineral uptake can be used to determine the mineral status of farm animals under field conditions. The percentage of red cell radiomineral uptake is inversely proportional to serum and dietary mineral levels. (ii) copper deficiency in sheep in the middle part of the Black Sea region of Turkey was investigated using several approaches. Results show that it is a conditioned (i.e. secondary) copper deficiency. Comparison of different parameters such as ceruloplasmin levels, serum Cu level, forage Cu, Mo and S concentrations as well as environmental conditions are useful indicators to evaluate the copper status of ewes.

49924 (IAEA-TECDOC—267, pp 113-122) **Copper and cobalt status of sheep and cattle grazing the central highlands of Peru elucidated by enzyme analysis and nuclear techniques.** Kalinowski, J. (Universidad Nacional Agraria La Molina, Lima (Peru)). Sep 1982. NTIS (US Sales Only), PC A09/MF A01. (CONF-8010327—).

From Research co-ordination meeting on the use of isotope techniques for detection of moderate mineral imbalances in farm animals; Nicosia, Cyprus (6 Oct 1980).

Studies of the copper and cobalt status of grazing ruminants were made through measurements of blood concentrations, plasma caeruloplasmin levels, and by the determination of vitamin B_{12} levels by radioassay. The results demonstrate not only the importance of sample handling techniques on the values obtained, but also the limitations of currently available techniques as indicators of mineral status.

49925 (IAEA-TECDOC—267, pp 135-146) **Absorption, distribution and excretion of arsenic-76 in hens and ruminants.** Anke, M.; Hoffmann, G.; Gruen, M.; Groppel, B.; Riedel, E. (Karl-Marx-Universitaet, Leipzig (German Democratic Republic). Sektion Tierproduktion und Veterinaermedizin). Sep 1982. NTIS (US Sales Only), PC A09/MF A01. (CONF-8010327—).

From Research co-ordination meeting on the use of isotope techniques for detection of moderate mineral imbalances in farm animals; Nicosia, Cyprus (6 Oct 1980).

The absorption, distribution and excretion of arsenic were investigated in goats and laying hens with the aid of ^{76}As. The results indicated that hens incorporated ^{76}As considerably faster than the goats. The preferential incorporation of arsenic into skin, hair and feathers may be important for the identification of As deficiency as well as As exposure. Moreover, the high incorporation demonstrated into epididymis, ovary and eggs could also be important in connection with disorders of reproduction.

49926 (IAEA-TECDOC—267, pp 163-187) **Marginal mineral deficiencies and their importance for the productivity and reproductivity of domestic animals.** Wegger, I. (Department of Physiology, Endocrinology and Bloodgrouping, Royal Veterinary and Agricultural Univ., Copenhagen (Denmark)). Sep 1982. NTIS (US Sales Only), PC A09/MF A01. (CONF-8010327—).

From Research co-ordination meeting on the use of isotope techniques for detection of moderate mineral imbalances in farm animals; Nicosia, Cyprus (6 Oct 1980).

Using selenium as an example some aspects of trace element metabolism especially in swine have been discussed in the preceding paper. Several investigations indicate that the chemical form of an element in the feed may influence its availability to and metabolism by the animals. Results lending further support to this are presented and discussed. A normal physiological condition which greatly enhances the requirement for nutrients including trace elements is pregnancy. The placental transfer of selenium is discussed in some detail and a survey of the theoretical minimum requirements for several elements at various stages of pregnancy is given. The possible relationship between marginal subclinical deficiencies and animal health especially the resistance towards infectious diseases is also touched upon. During the past few decades marginal mineral deficiencies or imbalances have become prominent problems in many parts of the world and under widely varying animal production systems. The possible causes of this unfortunate development are considered and the advantages and disadvantages of various methods to detect such conditions discussed. Special emphasis is laid upon screening methods suitable for depicting geographically limited areas where marginal deficiencies may be suspected to occur. In recent years the existence of genetically controlled variation in the trace element content of blood and tissues i.e. in the biochemical profile of animals belonging to the same race has become evident. These findings make it difficult to speak about "normal" values in blood and tissues. They also hamper the possibility of establishing normal requirements for the various trace elements.

49927 (IAEA-TECDOC—268, pp 81-83) **Physiogenetic regulation of dwarfness in barley.** Hopp, H.E.; Favret, G.C.; Favret, E.A. (Instituto Nacional de Tecnologia Agropecuaria, Castelar (Argentina)). Jul 1982. NTIS (US Sales Only), PC A07/MF A01. (CONF-8103168—).

From Research co-ordination meeting on semi-dwarf cereal mutants and their use in cross-breeding; Vienna, Austria (2 Mar 1981).

The physiogenetic regulation of barley growth was investigated by using two types of dwarf varieties. GA-less and GA-ins are single gene dwarf mutants, the first is very sensitive to exogenous GA_3 addition while the latter is completely insensitive to any addition of the hormone. When the GA-like content of the mutants was analyzed it became evident that while GA-ins showed almost the same chromatographic pattern as the normal type, GA-less had no detectable activity in the same conditions. (^{3}H)GA_1 fed to the roots was readily translocated to the sheaths and converted into at least four metabolites. It was found that the GA-less dwarf mutation does not modify GA_1 metabolism. These data are consistent with the presence of a structural dwarfing gene controlling the production of active gibberellins. In contrast, GA-ins dwarf formed significantly less amount of a polymer-bound GA_1 product than their isogenic counterparts suggesting that this product is important for normal development. These results are consistent with the presence of a second system of genes controlling the utilization of the active gibberellins thus regulating their biological effect. GA-ins coleoptiles consistently showed an increased sensitivity to auxins when compared to the normal genotype. Peroxidase isozymes seem not to be involved in the GA regulation of auxin induced elongation of barley coleoptiles.

49928 (INIS-mf—8093) **Transport and degradation of 2-^{14}C abscicine acid in the Coleus rehneltianus berger sprout.** Klaska, A. (Hamburg Univ. (Germany, F.R.). Fachbereich Biologie). 21 Mar 1979. 277p. (In German). NTIS (US Sales Only), PC A13/MF A01. Order Number DE83702766.

Thesis.

1 μg ABA-2-^{14}C aqueous solution was injected into the youngest or into a fully grown leaf of young and older coleus plants. The activity quantity in the various sprout parts is investigated after 2, 24 and 72 h; as well as which labelled substances other than abscisic acid (ABA) occur. The activity in the ethanol extracts was detected with the help of liquid scintillation measurements. Thin layer chromatography and gas chromatography were used to characterize the radioactive substances. The results show that ABA is degraded into three metabolites which are characterized by their relative Rsub(F) values using chromatography with LM 2 as substance 0.2, 0.5a, 0.5b and 0.8. Comparing with the

literature shows that it could be 6'-hydroxy methyl ABA, ABA glucoside, phaseic acid and dihydrophaseic acid. Young and old leaves in older plants have the same ability to degrade ABA taking the occurence of the 0.8 metabolite as standard. The degradation in younger plants is firstly very slight. However, within 72 h the ability of ABA degradation is induced in older leaves of younger plants, so that finally the degradation rate is as big as in older plants. Activity is essentially exported by adult leaves of older plants. The basipetal transport is considerably greater than the acropetal one. Results show that mainly ABA is transported in the acropetal test, whereas ABA and fraction 0.5 are transported in the basipetal direction. A reversed transport direction is observed after applying ABA to a young leaf. The transport basipetal is polarized in the first two hours, after 72 hours of transport there is a definite acropetal polarity. (orig./MG).

49929 **Use of ^{32}P in the study of phosphorus uptake and metabolism in plants.** Michalik, I. (Vysoka Skola Polnohospodarska, Nitra (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Slovak)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

The method allows following the uptake and metabolism of phosphorus and isolating in acids both soluble organic phosphorus compounds (i.e., esters of phosphoric acid with glycides, free nucleotides, inorganic phosphorus) and insoluble phosphorus compounds (i.e., macromolecular compounds, phospholipids). The method of separating low-molecular and acid-soluble phosphorus compounds by one-dimensional paper chromatography was also tested. In maize roots the following low-molecular phosphorus compounds were determined by autoradiochromatography: ATP, ADP, G-1-P, AMP, G-6-P, di PGA, Ri-5-P, F-1, 6-diP, 3-PGA, Pan.

5506 Medicine

REFER ALSO TO CITATION(S) 49603, 49604, 49605, 49606, 49607, 49609, 49610, 49611, 49612, 49613, 49614, 49616, 49907, 50014, 50063, 50065, 50263

49930 **(CEA-CONF—6491) Reconstruction algorithm using time of flight information to improve image quality in positron emission tomography.** Campagnolo, E.; Garderet, P.; Chabanas, L. (CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France)). Sep 1982. 4p. (CONF-820804—). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702416.

From 3. world congress of nuclear medicine and biology; Paris, France (29 Aug 1982).

Recent progress in fast time coincidence technique have permit the use of time of flight (TOF) information in Positron Emission Tomography. To incorporate the TOF data in the reconstruction process, definition of some new concepts are introduced and illustrated. An algorithm to recover positron activity is then proposed based on several assumptions. A mathematical estimation of signal to noise ratio shows how much the image quality is improved using TOF technique. The results may be resumed in a sensitivity gain figure for different phantom diameters; experimental results with uniform phantom appear to give an image quality in good agreement with our theoretical estimation.

49931 **(CEA-CONF—6492) New fast timing detectors for time-of-flight (T.O.F.) positron computed tomography (P.C.T.).** Vacher, J.; Allemand, R.; Laval, M.; Moszynski, M.; Odru, R. (CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France)). Sep 1982. 3p. (CONF-820804—7). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702434.

From 3. world congress of nuclear medicine and biology; Paris, France (29 Aug 1982).

In the field of the time-of-flight (T.O.F.) positron tomography, the state-of-the-art of high efficient and fast timing detectors technology and the new expected timing limits are presented.

49932 (IA—1375, pp 192-193) **Radioimmunoassay of progesterone in plasma without extraction using progesterone-^{125}I.** Canfi, A.; Shrem, S.; Teitelbaum, Z. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49933 (IA—1375, pp 194) **Preparation of a highly specific anti-estradiol antiserum for radioimmunoassay.** Canfi, A.; Solencheck, D.; Zafran, M.; Teitelbaum, Z. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49934 (IA—1375, pp 194-195) **Solid phase RIA for HCG. Pt. II.** Teitelbaum, Z.; Shrem, S.; Zafran, M. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49935 (IA—1375, pp 191) **Localization of abscesses by labelled white blood cells.** Lavie, E. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

49936 (IAEA-TECDOC—266, pp 15-20) **Radiobiological approach to cancer treatment. Possible chemical and physical agents modifying radiosensitivity in comparison with high LET radiations.** Sugahara, T. (Kyoto National Hospital (Japan)). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

Biological characteristics of high LET radiations are summarized to be low oxygen enhancement ratio, high RBE, low repair and low cell cycle dependency of radiosensitivity. Various chemical modifiers of radiosensitivity and radiological effect of hyperthermia are classified into these four properties. It is evident that we have now various means to mimic high LET radiations as far as biological response is concerned though some of them are still in experimental stage. Among them, the means to cope with hypoxia and repair which are assumed to be the most important causes of radioresistance of human tumors are discussed in some detail. It is expected that through the present seminar we would have consensus to concentrate our effort of development for new modifying means available and useful in developing countries.

49937 (IAEA-TECDOC—266, pp 35-40) **Radioprotective effects of WR-2721 and its clinical applications.** Tanaka, Y. (Kansai Medical School, Moriguchi, Osaka (Japan)). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

The dose-modifying factor (DMF) values obtained for normal mouse tissue ranged from 1.1 for kidney to 2.1 for bone marrow. The DMF value for growth delay in transplanted tumor (S-180) was 1.2. Distribution pattern of ^{14}C-WR-2721(=YM-08310) in the normal and tumor tissue was examined. The drug was found in the majority of tissues such as the salivary glands, kidney etc. at higher levels, while it was transferred into cancer tissue and central nervous system only at very low levels. In Japan, this drug was named "Fosteamine" and its Phase II study was finished with the collaboration of 8 hospitals. Side effects of this drug were for the most part negative up to 2.0 mg/kg/day (=60mg/m^2). Chemical laboratory findings such as liver function tests were within normal values. Protective effects to the oral mucositis by radiotherapy in carcinoma of oral cavity were examined and DMF (WR-2721 + X/X-alone) were 1.7 in Grade I and 1.3 in Grade II, respectively. In these groups the occurrence of xerostomia (52.9%) was decreased markedly compared with X-alone (73.3%). The incidence of lung fibrosis in lung cancer treated with radiation was slightly protected by this drug.

49938 (IAEA-TECDOC—266, pp 49-61) **Clinical potential of hypoxic cell radiosensitizers.** Brown, J.M. (Stanford Univ., CA (USA). Dept. of Radiology). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

Experience with high pressure oxygen in combination with radiotherapy has shown that, for some tumors at least, the presence of hypoxic cells is a limiting factor in the ability to cure these tumors even with conventional daily fractionation. This suggests that hypoxic cell radiosensitizers, of which misonidazole (MIS) is the prototype drug, may play a role in improving the cure-rate of some tumors when combined with daily fractionation. Even for those tumors for which no improvement is seen when combined with daily fractionation, it is likely that there will be an important role for these sensitizers by using them in combination with regimens of only a few dose fractions. Because of the limiting side effects of neuropathy, a less toxic radiosensitizer than MIS is required to gain the full clinical benefit of these drugs. A possible way of achieving this is to reduce the lipid solubility (lipophilicity) of the compounds whilst still retaining their electron-affinity. This reduces the concentration of drug in the neural tissues (brain, peripheral nerves) without affecting the tumor concentration. However, if the lipophilicity is too low, the drugs are unable to enter the hypoxic cells and hence lose their radiosensitizing efficiency. It would appear that a lipophilicity given by an octanol:water partition coefficient of approximately 0.04 is optimum, (cf. MIS = 0.43) with the 2-nitroimidazole amide SR-2508 the best in this series. Tumor levels of this drug of 7-8 times those obtained with MIS should be attainable clinically for no increase in neurotoxicity. Two other properties of electron-affinic sensitizers show clinical promise. The first is their ability to bind irreversably to hypoxic cells in the tumor, thus giving them the potential of tumor detection in nuclear medicine. The second is their ability to preferentially sensitize tumors compared to normal tissues to the cytotoxic action of several chemotherapeutic agents.

49939 (IAEA-TECDOC—266, pp 29-33) **Present status and future directions for radioprotective drugs in radiotherapy.** Yuhas, J.M. (Pennsylvania Univ., Philadelphia (USA)). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

Two agents have been identified which are able to selectively protect normal tissues against radiation injury while leaving the resistance of solid tumors unaltered: MPG and WR-2721. The present report summarizes what is known and what is not known about the latter of these agents, WR-2721 or aminopropylaminoethylphosphorothioate. This analysis is intended to not only identify those clinical situations in which WR-2721 might improve the effectiveness of radiotherapy, but also to point the way toward the development of even more effective agents. Pre-clinical studies in the laboratory had suggested that WR-2721 would be relatively well-tolerated by man and clinical experience has borne out these predictions. Although the drug dose which is maximally tolerated has yet to be reached in the clinic, it is already apparent that moderate to high levels of protection should be expected. Two problems, relative to drug toxicity, need to be taken into account: inappropriate handling of the drug can produce toxic breakdown products and certain of the drugs used in the symptomatic treatment of cancer patients can enhance the toxicity of WR-2721. This drug has been shown to protect all normal tissues studied, with the exception of the brain and spinal cord, and the therapeutic modalities which this drug can protect against include conventional and non-conventional radiations, and alkylating agents, whether they are given alone or in combination with radiation. Protection of tumors, on the other hand, is a rare observation, and can, in many cases, be traced to artefacts of the design or to factors which would not be encountered in the clinic. The basis of this selectivity has now been traced to a simple interaction of the drug with the tumor cell membrane and appropriate methods are now available which should allow us to not only optimize the clinical testing of WR-2721 but also to identify those agents which might be superior to WR-2721.

49940 (IAEA-TECDOC—266, pp 71-76) **Clinical trials of hypoxic cell sensitizer misonidazole in Japan.** Onoyama, Y. (Osaka Univ. (Japan)). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

To assess the safety and pharmacology of Misonidaloe in Japanese, a total of 106 patients with advanced malignancies were evaluated on the varied dose regimens. Mean plasma levels at the time of irradiation, 4-5 hours after oral administration, were 24.3 $\mu g/ml$ at the dosage of 0.5 g/m^2, 43.6 $\mu g/ml$ at 1.0 g/m^2, and 81.4 $\mu g/ml$ at 2.0 g/m^2. Various kinds of adverse reactions were observed during the radiotherapy combined with misonidazole, however the principal ones were gastrointestinal disorders and neurotoxities. Excluding transient and equivocal neurotoxity, peripheral neuropathy was noted in 4 patients, ototoxity in 2 and central nervous symptoms in the remaining one. Incidence of neurotoxity was related to total dose, fractional dose and interval. A maximum total dose of 10.0 g/m^2, provided that fractional dose does not exceed 1.5 g/m^2 for a once a week schedule, 1.0 g/m^2 for twice a week, and 0.5 g/m^2 for 5 times a week, seems to be the limit of tolerance to misonidazole in Japanese. Although our study was not designed to evaluate the efficacy, some observations on the response of tumors have been obtained. Our clinical impressions suggest that the drug is effective in about two-thirds of the patients who were evaluable for primary effect as compared with historical controls. Double blind control study for lung cancer, esophageal cancer, brain tumors, head and neck cancer and cervical cancer is now ongoing with the collaboration of about 40 institutions in Japan. The result of this study will be analysed in late 1982.

49941 (IAEA-TECDOC—266, pp 87-94) **Effect of concomitant use of immunomodulator (OK-432 and/or PSK) on primary lung cancer (stages III, IV) treated with radiation combined with chemotherapy.** Kimura, S.; Ogawa, Y.; Imajo, Y. (Kobe Univ. (Japan). School of Medicine). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

OK-432 (a lyophilized preparation of a low virulent strain, Su, of Streptococcus hemolytics (Group A) treated with penicillin G) and/or PSK (a protein-bound polysaccharide prepared from Coriolus versicolor) as an immunomodulator was administered to 209 patients of advanced lung cancer treated with radiation with combined chemotherapy. Their effects on immunological parameters and patients' survival periods were examined. Suppression of both PHA (phytohemaggiutinin) skin test activities and lymphocyte blastoid transformation with PHA were reduced in the immunomodulator administered group compared with the non-administered group. Survival curves were evaluated between the patients with OK-432 and/or PSK and those without immunomodulator. It was suggested that OK-432 and/or PSK combined with radiation with combined chemotherapy was effective for the elongation of the survival period. These results indicated that the long-term administration of OK-432 and/or PSK was recommended for patients with advanced lung cancer.

49942 (IAEA-TECDOC—266, pp 157-162) **Prospects in clinical hyperthermia.** Bicher, H.I. (Henry Ford Hospital, Detroit, MI (USA)). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

A large number of patients have now been entered into a phase I/II protocol to examine the effects of fractionated hyperthermia and radiation on tumor response. Included in the study were 11 different histologies with anatomical locations varying between peripheral and superficial metastases to deep seated, solid tumors. Patients were treated with four fractions of microwave induced hyperthermia (45.0 +- 0.5 deg. C), each separated by intervals of 72 hours. Treatments were 1-1/2 hours in duration to a volume encompassing the tumor. Microwaves at frequencies of 915 MHz or 300 MHz were employed. Patients were given a one-week rest following the first 4 treatments, following which a second series of 4 fractions were administered again at 72-hour intervals. Each of these fractions consisted of a 400 rad dose of radiation followed within 20 minutes by hyperthermia (42.5 +- 0.5 deg. C) for 1-1/2 hours. To date 121 fields have been treated in 82 patients. New technology allows for the treatment of deep seated tumors in the neck, chest and pelvis. Follow-up times range from 2 to 19 months. Total regression is seen in 65% of all cases, partial regression in

35% and no response is seen in only 5% of treatments. Six local and four marginal recurrences have been observed. Adverse effects were rare. Based upon our results (above) and those of other investigators, several modifications have been made in the above protocol. Site specific trials are currently in progress to study both the feasibility of deep seated heating with intracavitary antennas as well as to assess tumor response. In addition, a randomized trial to examine the clinical relevance of thermotolerance has been started.

49943 (IAEA-TECDOC—266, pp 163-176) **Hyperthermia combined with radiation in the treatment of cancer.** Hiraoka, M.; Abe, M. (Kyoto Univ. (Japan). Faculty of Medicine). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

Localized hyperthermia with or without radiation was applied to selected patients with radioresistant tumors such as malignant melanoma, fibrosarcoma, locally advanced bulky tumors and tumors recurred after a full course of radiotherapy. Hyperthermia was administered by microwave (2,450 MHz) or radiofrequency (13.56 MHz) according to the size and the location of tumors. Eight patients were treated by RF hyperthermia alone (41-46 deg. C for 30-60 minutes), and two patients experienced partial response, while remaining patients did not respond. Hyperthermia in combination with radiation was delivered to thirty-four patients with 37 lesions. Twenty-two lesions were treated with a microwave device and the remaining 15 were heated with an RF device. In most lesions, intratumor temperatures of 43 deg. C for 30 minutes were administered twice weekly immediately after radiation. Of twenty-two lesions treated with microwave, 11 (50%) showed complete response, 7 (32%) partial response and 4 (18%) no response. As regards fifteen lesions treated with RF, 7 (47%) showed complete response and the remaining 8 (53%) partial response. Ten lesions which had received a full course of radiotherapy to the treatment site showed a high response rate by hyperthermia in combination with radiation. A complication observed was cutaneous burn and was seen in 7 out of the 45 treatment sites. The results of our pilot study suggest that localized hyperthermia in combination with radiation is an effective and safe modality for the treatment of radioresistant tumors.

49944 (IAEA-TECDOC—266, pp 7-14) **Prospective methods of radiation therapy in developing countries.** Hall, E.J. (Columbia Univ., New York (USA). Radiological Research Lab.). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

A variety of new approaches have been suggested and are in various stages of implementation. High LET radiations were based initially on the premise that a lower oxygen effect would be advantageous. Charged particles offer the added bonus of an improved dose distribution. This solution, if it proves to be of value, must necessarily be expensive. For different reasons, sensitizers and protectors seek to exploit and exaggerate a differential sensitivity between normal tissues and tumors. The introduction of one or another, or possibly a combination of both, must surely be the biggest hope for a significant immediate advance in the effectiveness of beam therapy in the developing countries. Localized hyperthermia offers the prospect of a big advantage but poses unsolved technical problems. The technique is hamstrung by serious conceptual problems in producing localized regions of heat at a depth in the human. Meanwhile, the teaching of the basic skills of radiotherapy, including interstitial implants, is likely to pay the biggest dividends in the developing countries. Implant techniques have become a lost art, and many radiotherapists could be trained for the cost of one heavy particle accelerator. Lastly, the relative safety of agents and modalities used to treat cancer must be appreciated in terms of their potential to produce second malignancies in patients that survive for significant periods of time. Radiation is a relative weak carcinogen, and this is borne out in the low incidence of second tumors in patients treated by X-rays. By contrast many chemotherapy agents are potent carcinogens. Misonidazole and other hypoxic cell sensitizers are carcinogens too, but weakly so, while hyperthermia appears to be completely safe in this respect.

49945 (IAEA-TECDOC—266, pp 95-99) **Present state of the combined treatment with radiation and chemicals.** Shigematsu, Y.; Masaki, N.; Ikeda, H. (Osaka University Hospital, Dept. of Radiology (Japan)). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

Of malignancies in which the results have been markedly improved by combined treatment with radiation and chemicals for the past decade, non-Hodgkin's lymphoma localized in head and neck and intra-oral carcinoma are presented. In the management of non-Hodgkin's lymphoma, the authors stressed the following: 1) Rappaport's classification has been a help to evaluate the prognosis; 2) lymphoma of the Waldeyer's ring should not be included in nodal lymphoma, and also it should be separated from extranodal lymphoma as well, because of different prognosis; 3) It seems that some kinds of chemotherapy would have a role in improving the results of radiotherapy in the management of radiotherapy, even in localized cases. In some types of intra-oral carcinomas, bleomycin was found to be useful in the combined treatment with radiation as follows: 1) A minimum required dose for local control of intra-oral carcinomas could be a combination of 30Gy in 3 weeks and 100mg bleomycin during the same period. 2) Although the end results of patients with carcinoma of tongue or floor of mouth have not been improved by this approach, there was marked improvement in patients with carcinoma of the lower gum. 3) For the treatment, the side effect as limiting factor was mucositis, and none of the cases of the series developed pulmonary complication.

49946 (IAEA-TECDOC—266, pp 101-107) **Combination therapies in oral squamous cell carcinomas.** Krishnamurthi, S.; Shanta, V. (Cancer Inst., Madras (India)). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

The clinical trials are reported involving combined radiotherapy and chemotherapy in oral squamous cell carcinomas. Bleomycin was the only drug that potentiated radiation response in buccal squamous cell carcinomas. The response of the primary tumors was consistent, predictable and reproducible. The following drugs or chemicals were used: synkavit, methotrexate, metronidazole, bleomycin, pepleomycin, and hyperbaric oxygen. The results and their comparison is given in tables.

49947 (IAEA-TECDOC—266, pp 177-184) **Present status and future development of radiotherapy in China.** Wu, H.X. (Cancer Research Inst., Chinese Academy of Medical Sciences, Peking). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

The present status and future prospects of radiotherapy in China were reported. After 1950, with the improvement of living and nutritional conditions and due to better health care and medical service, the general mortality rate has markedly decreased and the life expectancy has increased; subsequently malignant diseases have become of greater importance. At present, mortality due to cancer stands second on the list of causes of death for men and third for women. An increasing number of cancer patients is reflected in the greater demand of radiotherapeutic services. However, well-equipped hospitals are only located in a few large cities and orthovoltage machines are still being manufactured. Therefore, modernized cancer hospitals and research institutes are being established in the various provinces and large cities. The training plan for qualified medical, physical and technical persons involved in radiotherapy is also of importance as well as the supply of radiation equipment. In clinical radiotherapy, there is a trend to use combination therapy of surgery, radiation and chemotherapy in the cancer hospitals. 60-65% of all cancer patients at the Cancer Research Institute in Peking are treated by radiation therapy in combination with surgery or chemotherapy. Intra-operative irradiation has been adopted in the management of intra-abdominal malignancies, and pre-operative irradiation treatment has given especially good results in cervix and nasopharynx cancer. The combination treatment of radiation and hyperthermia is now being investigated.

49948 (IAEA-TECDOC—266, pp 195-203) **Intraoperative radiotherapy in Japan.** Abe, M.; Takahashi, M. (Kyoto Univ. (Japan). Faculty of Medicine). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

Clinical results of intraoperative radiotherapy (IOR) which have been obtained in Japan were reviewed. In IOR of gastric cancer, a single dose of 2800-4000 rad was delivered. The 5-year survival rates of the patients treated by operation alone were 93.0% for Stage I, 54.5% for Stage II, 36.8% for Stage III and 0% for Stage IV, while those of patients treated by IOR were 88.1% for Stage I, 77.6% for Stage II, 44.6% for Stage III and 19.5% for Stage IV. In pancreatic cancer, long-term survivors could hardly be obtained because of the advanced stage of the disease. However about 80% who complained of severe abdominal pain experienced relief within a week after irradiation with more than 2000 rad. In colon cancer, a cancerocidal dose can be delivered safely, since normal intestine is shifted from the field. Five of 14 patients treated by IOR are alive and 2 of the five patients have survived more than 5 years. In patients with glioblastoma, it was demonstrated that those having received external irradiation, followed by a second craniotomy combined with necrotomy and IOR to the residual tumors, yield significantly better results than those having received conventional treatment. In prostatic cancer, satisfactory local control could be obtained by IOR with a single dose of more than 3300 rad without complications of rectovesical function. In mediastinal tumors, two of the 9 patients treated by IOR have survived more than 5 years with no sign of pulmonary fibrosis. In soft tissue sarcomas IOR has yielded a local control rate of 73.3% without affecting the skin overlying the tumor.

49949 (IAEA-TECDOC—266, pp 117-122) **After-loading techniques in brachytherapy. Gynaecology and interstitial treatments.** Chassagne, D. (Institut Gustave Roussy, 94 - Villejuif (France)). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

The basic principles of brachytherapy are recalled: geometrical arrangement and low dose-rate continuous irradiation. After-loading is the basis of modern brachytherapy which allows a better protection and the use of new techniques. In interstitial curietherapy Iridium sources are widely used for removable implants with various new indications, four examples are given. Iodine 125 seeds are used for permanent implants. In endocavitary curietherapy Cesium 137 sources replace Radium sources. The use of projectors (remotely controlled machines) achieves an absolute protection. Machines are commercially available for low, medium or high dose-rate. Emphasis is put on the increased care which is necessary with the use of high dose-rate (with Co 60 sources). These modern brachytherapy techniques have permitted some new concepts in Dosimetry both in interstitial and gynecology. On the economic point of view, brachytherapy does not necessitate a high investment and therefore can be more widely used whenever a well-trained staff exists. Modern brachytherapy is still under development and few examples on "works in progress" at the Gustave-Roussy Institute are given.

49950 (IAEA-TECDOC—266, pp 123-135) **Fractionation of intracavitary treatment of uterine cancer patients with high intensity sources of Co-60 and Cs-137.** Hashimoto, S.; Ito, H.; Dokiya, T.; Yoshioka, T. (Keio Univ., Tokyo (Japan). School of Medicine); Yamashita, H. (Keio Cancer Center, Tokyo (Japan)). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

In order to avoid hazardous radiation exposure to the medical staffs concerned with the brachytherapy, remotely controlled after-loading method using high intensity sources of Co-60 or Cs-137 have been employed. This report presents the results of treatment of patients with cervical cancer by different fractionations, that is single or two exposures a week. During 1973-1977, 500-540 rad was given as a daily dose at point A and repeated 2 times a week for a total dose at point A of 3,000-3,200 rad by 6 fractions in 18-21 days. From January 1978, the daily dose at point A was increased to 800 rad and was given once a week and repeated 3 times, providing a total dose at point A of 2,400 rads in 15 days. Additional external irradiations were almost the same in both groups. In the former group, 194 patients were treated. After 1978, 77 patients were irradiated by the latter method. The 3-year cumulated survival rate of stage II patients were 76% in the former and 94% in the latter. Those of stage III were 67% and 64%, respectively. The incidence rate of radiation therapy failure in pelvis and response to treatment were not different between two groups. There were no significant differences between two groups of the late intesional and urinary complications. However, if the patients with stage III cervical cancer were divided into three groups according to the tumor volume, the survival rate of patients with large tumor volume treated by the latter method was worse and not acceptable. It could be presumed that no remarkable difference was observed in survival rate (except stage III large tumor volume) and side effects between the two groups, indicating that a single exposure per week with an adequate dose may not be harmful.

49951 (IAEA-TECDOC—267, pp 123-134) **Ferritin in cattle serum.** Lengemann, F.W.; Lopera, J.A.; Kallfelz, F.A. (Cornell Univ., Ithaca, NY (USA)); Lengemann, F.W. Jr. (Rome Veterinary Clinic, PA (USA)). Sep 1982. NTIS (US Sales Only), PC A09/MF A01. (CONF-8010327—).

From Research co-ordination meeting on the use of isotope techniques for detection of moderate mineral imbalances in farm animals; Nicosia, Cyprus (6 Oct 1980).

A commercially available radioimmunoassay kit for human serum ferritin was used to determine the ferritin concentration in serum or plasma of 41 calves from 0 to 106 days of age, 192 cows and 35 bulls from 2 to 11 years of age. The geometric average concentration of ferritin was 2.1, 12.6 and 4.5 ng/ml for the calves, cows and bulls, respectively. The cows were statistically different from the calves and bulls; there were no differences between the calves and bulls. Within the cows one herd was found to have lower serum ferritin levels than all the other herds ($P < 0.05$) but no differences in packed cell volumes were present. The data suggest that a radioimmunoassay procedure with a ferritin antibody specific for bovine ferritin could be useful in the study of iron metabolism in cattle.

49952 **(INIS-mf—7781(Vol.1)) Summaries from 17. week of the Balcan Medical Union, 29 Aug - 3 Sep 1982.** (Balcan Medical Union, Sofia (Bulgaria)). Sep 1982. 200p. (In French). (CONF-8208125—Vol.1-Summ.). NTIS (US Sales Only), PC A09/MF A01. Order Number DE83780964.

From 17. symposium of the Balcan Medical Union; Sofia, Bulgaria (29 Aug 1982).

Items within the scope of EDB have been entered individually into the data base. (ACR)

49953 **(INIS-mf—7781(Vol.2)) Summaries from 17. week of the Balcan Medical Union, 29 Aug - 3 Sep 1982.** (Balcan Medical Union, Sofia (Bulgaria)). Sep 1982. 180p. (CONF-8208125—Vol.2-Summ.). NTIS (US Sales Only), PC A09/MF A01. Order Number DE83780946.

From 17. symposium of the Balcan Medical Union; Sofia, Bulgaria (29 Aug 1982).

Items within the scope of EDB have been entered individually into the data base. (ACR)

49954 **(INIS-mf—8028) Circular No 828 of 3 August 1972 concerning the use of artificial radioelements in unsealed sources in the biological and medical field.** 3 Aug 1972. 8p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780774.

Issued by the Ministry of Public Health.

This Circular prescribes the procedure for organizing the use of artificial radioisotopes in unsealed sources in medical establishments and for research purposes, and provides for prior authorization by the Ministry of Public Health. (NEA).

49955 **(INIS-mf—8032) Order of 26 March 1974 on the qualification of persons enabled to use artificial radioelements in unsealed sources for medical purposes.** 20 Apr 1974. 2p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780786.

Published in the French Official Gazette.

This Order prescribes the qualifications required to administer artificial radioisotopes in unsealed sources for diagnostic or therapeutic uses. (NEA).

49956 **(INIS-mf—8034) Order of 23 April 1969 concerning the approval of devices and facilities using ionizing radiations for medical purposes.** 8 Jun 1969. 2p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780787.

Published in the French Official Gazette.

This Order lays down the conditions of approval of radiation emitting devices for radiotherapy and dentistry. It provides for periodic controls of such appliances. (NEA).

49957 **(INIS-mf—8086) Comparative study of unilateral renal tubule function using ^{131}I-o-hippuran and sup(99m)Tc-dimercaptosuccinic acid with regard to renal depth and excretion relations.** Moser, E.A. (Muenchen Univ. (Germany, F.R.). Fakultaet fuer Medizin). 15 Jan 1980. 82p. (In German). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702788.

Thesis.

Good agreement was found between sonographic and nuclear renal depth data. In patients with undisturbed postrenal urodynamics, the data of unilateral renal clearance obtained by DMSA and OIH are in good agreement after depth correction. With OIH, the activity measured for unilateral congestion kidneys was higher than with DMSA. However, both methods may overestimate unilateral congestion kidneys. The OIH method should be favoured in nuclear renal diagnostics. In patients with mobile kidneys, the lower function calculated for the ptotic kidney can be evaluated only after depth correction. To reduce the radiation exposure, renal depth data required for depth correction should be determined by sonographic methods. The peak/scatter method of renal depth determination cannot be employed in practice in the ^{131}I hippurane test; in the sup(99m)Tc-DMSA test, sufficient agreement between peak/scatter quotient and renal depth is only obtained after background correction. The result does not warrant the tedious procedure. DMSA studies of the kidneys are appropriate in the following cases: 1. Emergency studies of unilateral renal function in cases of acute anuria due to postrenal stoppage. 2. Assessment of unilateral parenchymal function in patients with mobile kidneys if the ptotic kidney cannot be imaged by sonographic processes. 3. Search for extremely displaced renal tissue. 4. Unilateral renal function studies in patients with unilateral kidney diseases if the postrenal situation and the global renal function can be assessed by other methods. (orig./MG).

49958 **(INIS-mf—8088) Comparison of results of integrated nuclear medical kidney examinations in different stages of Diabetes mellitus.** Krieger, E. (Technische Univ. Muenchen (Germany, F.R.). Fakultaet fuer Medizin). 12 Jul 1979. 111p. (In German). NTIS (US Sales Only), PC A06/MF A01. Order Number DE83702789.

Thesis.

In 67 diabetics and 33 hypertonics the author carried out the following tests: 1. Serial renal function scintiscanning with ^{131}I-oJH; 2. Simultaneous assessment of global sup(99m)Tc-dtpa and ^{131}I-oJH clearance using a partly screened-off whole-body count 3. Unilateral assessment of ^{131}I-oJH clearance; 4. Assessment of sup(99m)Tc-dtpa and ^{131}I-oJH excretion. From the integral gamma-camera time-activity curves established by ROI technique as a part of serial functional scintiscanning, the nephrogram parameters secretion value, secretion maximum and elimination half-time were ascertained. The values thus obtained were compared with the global and unilateral ^{131}I-oJH clearance. Moreover the excretion of the radiopharmaceuticals in the urine was compared with whole-body clearance determined simultaneously. At normal renal function, the biological half-life for ^{131}I-oJH and sup(99m)Tc-dtpa was calculated and the distribute volumes were assessed from the elimination constant and from renal clearance. The results of the nuclear-medical renal-function parameters in varying stages of diabetic renal disease indicate that the elimination half-time is the only RIN criterion to permit a differentiation of collectives. (orig./MG).

49959 **(INIS-mf—8089) Primary radiotherapy of mammary carcinomas: Mammographic findings in course control.** Abdul-Kadir, F. (Freie Univ. Berlin (Germany, F.R.). Fachbereich Humanmedizin). 11 Mar 1980. 51p. (In German). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702793.

Thesis.

The collective consisted of 20 patients with mammary carcinoma subjected to radiation treatment only. By retrospective evaluation they were divided in two groups: a group with recidivations or progress of the growth and a group where the tumor was removed or divitalized by radiation. In order to establish radio-optical criteria describing the late effects of radiation and to permit differentiation of lymphangiosis carcinomatosa from radiation fibrosis as well as a forecast of the therapeutic result, the course after radiation was observed by mammography. It turned out that the size of the tumor before radiation and the persistence of the tumor mass in the first year after radiation have substantial bearing on the medical prognosis. There is a correlation between the persistence of ray-shaped extensions of the tumor long after radiation and recidivation or a progressive course. Lumphangiosis carcinomatosa and radiation fibrosis can only be differentiated using clinical and other aids, or retrospectively.

49960 **(INIS-mf—8090) Gonad doses in radiotherapy. Phantom measurement in mammary carcinomas, Morbus Hodgkin, seminomas, hypernephromas, and rhabdomyosarcomas of the thigh.** Liebstueckel, L. (Wuerzburg Univ. (Germany, F.R.). Medizinische Fakultaet). 28 Jun 1979. 53p. (In German). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702787.

Thesis.

The gonad doses in the therapy of malignant diseases were determined under defined conditions with the aid of a ^{60}Co and a ^{137}Cs irradiation appliance using an Alderson and paraffin phantom each. The measurements were carried out with a condiometer by Physikalisch-Technische Werkstaetten, Freiburg. Two different types of condensator chambers with a measuring range 15 mR to 8 R were used. In the irradiation of mammary carcinoma using the Alderson phantom with two tangential stationary fields the ovarian dose was 0.49 to 1.05 per mille, the testicular dose 0.3 to 0.47 per mille of the maximum irradiated dose. If mammary carcinomas are irradiated using a Caesa-Gammatron, the ovarian dose varies from 0.04 to 0.78 per mille within the five fields, the testicular dose from 0.01 to 0.13 per mille. For these measurements the paraffin phantom was used. If the radiation technique was somewhat modified, the ovaries (testes) of the Alderson phantom irradiated for Hodgkin's disease received 7 (4.7) per mille from irradiation of the thoracal field and 4.6 (3.2) per mille from irradiation of the mediastinal field. Irradiation of the abdominal field produced doses for the female and male gonads of 520 resp. 47.2 per mille. On irradiation of the para-aortic field, the ovaries and testes received doses of 8 resp. 4.6 per mille. Irradiation of the Alderson phantom for seminoma involved testicular doses between 29.1 and 3.1 per mille, depending on the size of the field and its distance from the gonads. Hypernephroma irradiation was carried out on the Alderson phantom with two pendular fields. The ovaries received between 3.7 and 14 per mille and the testes between 2.3 and 3.3 per mille of the focal dose. In irradiation for rhabdomyosarcoma, simulated with the paraffin phantom, the ovarian doses ranged between 5.5 and 11.9 per mille. The male gonad dose rose to values between 36.5 and 458 per mille of the focal dose. (orig./MG).

49961 **(INIS-mf—8091) Measurements of serum thyroxine (T_4). A comparison of measurement of serum thyroxine by means of the competitive protein binding reaction and of radioimmunoassay.** Maekelae, H. (Kiel Univ. (Germany, F.R.). Medizinische Fakultaet). 25 Feb 1981. 33p. (In German). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702790.

Thesis.

Thyroxine concentrations were determined in patient sera, control sera, and diluted sera using RIA and CPBR in order to assess the reliability and applicability of the two methods. Further, the influence of serum protein concentrations on the measured results was to be determined. Both methods were excellently reproducible when serum samples with constant concentration were used. RIA values were higher than CPBR values in all patient sera, but the difference is more or less pronounced in the various ranges of concentration. This was partly due to the dependence of CPBR on the total serum protein concentration. The uncertainly factor of the RIA was 23,5% while the uncertainly factor of the CPBR amounted to 57,5%. The RIA is thus better suited to determine the total serum t_4 concentration. (orig./MG).

49962 **(INIS-mf—8107) Experiments on the radioimmunological determination of the triiodothyronine binding capacity of human blood serum.** Traub, H.W.J. (Tuebingen Univ. (Germany, F.R.). Medizinische Fakultaet). 1980. 53p. (In German). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702767.

Thesis.

Bovine serum antibodies have been obtained from rabbits. Constant amounts of antibodies have been incubated with increasing amounts of antigens. The maximum value found for T_3 binding to the antigen-antibody complex was 66 μg RA/mg antigen. Human serum samples containing 0,05 ng ^{125}J-$T_3/\mu l$ were incubated with 600 μg RA, and the antigen was precipitated with 8,4 mg anti-RA. The mean value obtained for 30 enthyreotic test persons was a binding to RA of 7.9 +- 0,52% ^{125}J-T_3. Comparative measurements of patient and standard serum samples shared only slight differences. This means that the measured data do not reflect the thyroid function. (orig./MG).

49963 (INIS-mf—8137, pp vp) **Safe and effective use of radiopharmaceuticals.** Trott, N.G. (Royal Marsden Hospital, Sutton (UK)). 1982. NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

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In the medical applications of radionuclides, we have to arrange effective radiation protection of patients, staff and general public, maintain high standards of pharmaceutical safety and ensure that the radiopharmaceuticals are effective in use. The influence of the 1976 Council of the European Communities Euratom Directive in producing legislation in the United Kingdom controlling medical work with radioactivity is discussed. Attention is drawn to current studies in the dosimetry of radiopharmaceuticals, and some of the problems that continue to arise in evaluating the dosimetry and possible hazards of isotopes of iodine are discussed. Developments in facilities for preparing radiopharmaceuticals in hospital laboratories are considered and a short report is given of an extensive study of quality control procedures which showed that it was difficult to justify their use as a routine on established products.

49964 (INIS-mf—8137, pp vp) **Measurements from emission computerized tomography.** Soederborg, B.; Dahlborn, M.; Thunberg, S.; Virgin, J. (Soedersjukhuset, Stockholm (Sweden)). 1982. NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

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Emission computerized tomography (ECT) registers the isotope distribution in slices of a scanned object. In clinical routine the scan evaluation is ordinarly made visually. In earlier studies, some factors associated with the method such as reconstruction algorithm, physical properties of the tomographic gamma camera and clinical applications have been analyzed. The purpose of this investigation was to further analyze some of the specific problems associated with the numerical analysis and its consequences as to the visual interpretation.

49965 (INIS-mf—8137, pp vp) **Imaging performance of ^{201}thallium 7-pinhole tomography in comparison with planar imaging: value and limitations.** Sochor, H. (Vienna Univ. (Austria). Kardiologische Abteilung); Kaindl, F. (Krankenhaus der Stadt Wien-Lainz (Austria). Nuklearmedizinisches Inst.). 1982. NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

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72 patients underwent planar and 7-PH ^{201}Tl imaging with a mobile gamma camera to compare tomography and conventional techniques concerning their ability to localize and assess defect in coronary artery disease (CAD) patients with and without previous myocardial infarction (MI). 46 patients had rest-exercise studies, 26 patients only had resting scans, 14 of them in the acute phase of MI. Data were analyzed qualitatively and quantitatively for both procedures. In patients without MI (N = 35) sensitivities increased significantly from 60% (Planar qual.), 74% (Planar quant.) to 83% (Tomo qual.) and 90% (Tomo quant.). In patients with large infarcts whereas in small lesions the tomographic approach was performing slightly better. In all patients demonstrating reversible ischemia despite myocardial infarctions there also was significant increase in detection ability of lesions (72% Planar qual., 76% Planar quant., 87% Tomo qual., 91% Tomo quant.). Diagnostic accuracy was highest for the quantitative 7-PH approach (89%), being not significantly different from the qualitative approach (86%), but substantially higher than planar imaging (79% for Planar quant., 73% for Planar qual.). Specificities of all approaches were not significantly different. In all patients with reversible perfusion defects 7-PH can add a substantial win in detection rate in patients without previous myocardial infarction whereas in patients with myocardial infarction 7-PH imaging does not offer significant advantages. Both tomographic and planar imaging are highly sensitive for the detection of coronary artery disease but tomographic imaging is more sensitive in patients without previous myocardial infarction.

49966 (INIS-mf—8137, pp vp) **^{201}Tl for myocardial scintigraphy. A phantom study using emission tomography.** Schnell, P.O.; Larsson, S. (Kungliga Karolinska Medico-Kirurgiska Inst., Stockholm (Sweden)). 1982. NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

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The application of Emission Computed Tomography (ECT) for examinations of the myocardium is now being frequently reported. Only little information, however, is available regarding the detectability of perfusion defects and its dependence of factors such as the size and location of the defect, the section plane and the angular interval for acquisition. These factors have been analyzed from experiments using the SPETS tomographic system and a GE 400T gamma camera. All studies were performed on an 'IOWA' heart-phantom with ^{201}Tl and, for comparison, with ^{99m}Tcsup(m). Deviations in count density due to perfusion defects were analyzed. With the geometry and positioning of the phantom used, oblique sections were superior to transverse sections. Data acquisition within an angular interval of 180° instead of 360°, without change of total measuring time, produced images with better counting statistics and about the same change of count density in the defect areas. Under ideal conditions, a 6 ml defect was detectable in all positions, but due to the effect of attenuation, a careful evaluation was required, especially in the posterior wall. A 12 ml defect was easily observed in all studies. Comparative studies demonstrated favourable properties of ^{99m}Tcsup(m) over ^{201}Tl.

49967 (INIS-mf—8137, pp vp) **Attenuation correction for emission computed tomography.** Scheuerlein, H.; Wolff, M. (Philips GmbH, Hamburg (Germany). CHF Mueller Unternehmensbereich:. 1982. (In German). NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

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The single-photon-emission-tomography with a rotation gamma camera is a method to compute threedimensional activity distributions. The quality of the reconstructed slices depends besides of the method of back-projection upon a suitable absorption correction. The method described here corrects the projection data under the assumption that absorbtion is uniform within the body. The length of absorption is computed from the body contour. The body contour itself is computed by using the coordinates of the comptonscattered events, which are recorded simultaneously with a second analyzer channel.

49968 (INIS-mf—8137, pp vp) **Method for correction of gamma camera non-uniformity in single-photon emission computed tomography.** Axelsson, B.; Israelsson, A.; Larsson, S. (Kungliga Karolinska Mediko-Kirurgiska Inst., Stockholm (Sweden)). 1982. NTIS (US Sales Only), PC A17/MF A01.

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The use of gamma cameras for Emission Computed Tomography (ECT) will impose higher demands on gamma camera uniformity than conventional scintigraphy. The ECT-technique enhances image contrast and thus also the magnitude of small uniformity defects which results in disturbing image artifacts. The image artifacts will not seriously affect the diagnostic accuracy unless the investigated organ is at the center of rotation. The measurements were performed on a GE 400T operating with the SPETS system. A uniformity correction technique based on floodfield data from 16 different angles form 0 to 360 degrees has been developed. This technique enables acquisition of enough counts to have satisfactorily small statistical errors and will also compensate for uniformity changes that occur during rotation of the camera. Different flood-source configurations were used to obtain the correction data. The best results, for correction of ^{99}Tcsup(m) studies, were obtained using a ^{99}Tcsup(m)-flood source and 5 cm of polystyrene between the source and the camera. Using this technique the image artifacts were considerably reduced.

49969 (INIS-mf—8137, pp vp) **Image quality maintenance program for rotating gamma camera spect.** Keyes, J.W. Jr.; Rogers, W.L.; Clinthorne, N.H.; Koral, K.F.; Harkness, B.A. (Michigan Medicine Center Univ., Ann Arbor. Md. (USA)). 1982. NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

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Production of artifact-free SPECT images requires much better camera performance than routine scintigraphy. Based on simulation studies and extensive practical experience the following quality control program is recommended: 1) Field uniformity variations must be reduced to less than 1%. This requires field flood correction by computer. To eliminate statistical artifacts, the correction floods must contain 30 million counts. Daily determination of field flood uniformity and correction of all images is required. 2) Center-of-rotation must be determined to within +- 1/4 pixel at least weekly and after any camera or computer adjustment. 3) Pixel size must be accurately determined on the same frequency basis as center-of-rotation. 4) Camera-table alignment must be established with great accuracy during the set-up for each patient study. Adherence to this program will insure artifact-free images under the most difficult clinical imaging situations.

49970 (INIS-mf—8137, pp vp) **Single photon emission computerised tomography (spect): Quality control and assurance.** Todd-Pokropek, A. (University Coll., London (UK)). 1982. NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

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Careful establishment of a SPECT program is essential. Firstly the system must be set-up so that uniform images with reasonable resolution are obtained with both physical and anthropomorphic phantoms, such that clinical results can be interpreted with confidence, or rather, that confidence limits can be established. Secondly, a quality control program should be established to ensure continuing good performance of the system, which normally implies daily checks of a number of parameters. The key parameters to validate in such a program are: 1. Centre of rotation (X and Y offset). 2. X and Y axis gain (for 2 headed systems). 3. Uniformity (both sensitivity and spatial distortion). 4. Energy (window, uniformity and resolution). 5. Contrast. A careful control of the energy window, essentially as a function of everything else in the system, is critical. The influence of energy as a factor in the quality of SPECT images needs to be studied further.

49971 (INIS-mf—8137, pp vp) **Scintigraphy of pheochromocytomas.** Fischer, M.; Winterberg, B.; Vetter, H. (Muenster Univ. (Germany, F.R.)). 1982. (In German). NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

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Using a gamma camera-computer system, adrenomedullary scans were obtained in 7 patients after i.v. application of I^{131} metaiodobenzyl-guanidine, 0.35 to 0.7 mCi. Three patients had unilateral pheochromocytoma, while one female presented with the malignant multilocular variety of the disease. The diagnosis was confirmed by surgery. Three patients with hypertension and catecholamine levels in the upper normal range served as controls. In the pheochromocytoma cases the lesion(s) were successfully localized scintigraphically 24 to 72 hours after application. In the controls the scans failed to visualize the adrenal medulla. This new non-invasive technique is a simple and safe tool for identifying and localizing malignant and benign uni- as well as multilocular pheochromocytoma.

49972 (INIS-mf—8137, pp vp) **Half-life of thrombocytes in comparison to other radioimmunological data at patients with atherosclerosis.** Jaeger, E.; Sinzinger, H.; Hoefer, R. (Vienna Univ. (Austria). 2. Medizinische Klinik); Fitscha, P. (Allgemeine Poliklinik, Vienna (Austria). Interne Abt.); Kaliman, J. (Vienna Univ. (Austria). Kardiologische Abt.). 1982. (In German). NTIS (US Sales Only), PC A17/MF A01.

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Since about 10 years platelet half life is recognized as an important in-vivo parameter of platelet function. Platelet half life was found to be shortened in atherosclerotic disease, as reported by several authors. Only few data however are available about the relation of platelet half life with other parameters of platelet function. In 33 patients with angiographically verified atherosclerotic lesions several other parameters of platelet function were compared with platelet half life. Platelet half life, thromboxane B_2 (TXB_2), β-thromboglobulin (βTG) and platelet factor 4 (PF4) were measured and the correlation coefficients between these values were calculated. Platelet half life was significantly reduced ($p < 0{,}001$) in comparison to a control group of 26 healthy persons whereas TXB_2, βTG and PF4 were found to be significantly elevated ($p < 0{,}005$). A significant negative correlation was observed between platelet half life and the other platelet function parameters. Furthermore the platelet function parameters TXB_2, βTG and PF4 correlated significantly with each other. Our results demonstrate the reproducibility of platelet function tests and emphasize their clinical usefulness.

49973 (INIS-mf—8137, pp vp) **Hepatic uptake of ^{14}C-monosaccharides and conversion to serum glycoproteins in normal and cirrhotic rats.** Shreeve, W.W.; Modesto, R.R.; D'Allesandro (New York Univ., NY (USA). Medical Center). 1982. NTIS (US Sales Only), PC A17/MF A01.

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Certain special monosaccharides-galactose, galactosamine, and glucosamine - are actively metabolized by liver. Labeling by positron emitters, ^{11}C or ^{18}F, could provide a new type of agent

for external analysis of metabolic function. In order to test this potential, normal and cirrhotic (CCl_4-induced) Sprague-Dawley rats were given intravenously (i.v.) or intraperitoneally (i.p.) one or another ^{14}C-monosaccharide or ^{131}I-Rose Bengal. Liver/serum radioactivity ratios showed the order: galactosamine > Rose Bengal > glucosamine. Peak (30-60 minutes) ratios for galactosamine were 5-7 (i.v.) and 8-10 (i.p.). Concentration relative to liver was about 1/2 in kidney, 1/4 in spleen and negligible in heart and lung. There was little difference in peak uptake in liver between normal and cirrhotic rats (unlike Rose Bengal). For ^{14}C-galactosamine in cirrhosis there was prolonged hepatic retention with 3-fold lower 60/120 minute activity ratio than in normal. Accordingly, there was also 3-fold higher activity an serum proteins of normal rats than of cirrhotic rats (at 4 hours). Findings suggest that a.) labeled galactosamine could be a potential liver-imaging agent, b.) hepatic retention of the agent in human cirrhosis may occur and c.) low appearance of ^{14}C or other tracer in serum glycoproteins may also occur.

49974 (INIS-mf—8137, pp vp) **Elimination of thyroid gland hormones with plasma membrane separaton by the help of 131 iodine thyroxine and whole body counting.** Mostbeck, A.; Koehn, H.; Bergmann, H.; Bialonczyk, Ch. (Wilhelminenspital, Vienna (Austria). Nuklearmedizinisches Inst.; Ludwig Boltzmann-Institut fuer Nuklearmedizin, Vienna (Austria)); Zimmermann, E.; Frohner, K.; Unger, G.; Steinbach, K. (Wilhelminenspital, Vienna (Austria). 3. med. Abt.). 1982. (In German). NTIS (US Sales Only), PC A17/MF A01.

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11 plasma membrane separations have been carried out in 6 patients. The levels of 131 I-albumin, 113m In-transferrin, 131 I-thyroxine, TT4, T3, FT4, rT3 and TBG and additionally for one patient of digoxin have been determined in plasma and separated fluid during the treatment. During 3 separations also the change in total body activity after injection of 131 I-labelled thyroxine was monitored with a whole body counter. According to the results of whole body counting, an exchange of 125% of the plasma volume resulted in a loss of approximately 20% of radioactivity within the body. In euthyroid patients plasma exchange is accompanied by considerable increase in rT3 and remarkable excretion of FT4. The amounts of both substances in the separated fluid exceeded those present in the plasma before separation (109% and 176%, respectively). For all other substances, including TBG, 60 +- 5% of the fluid. The decrease in concentration of most compounds followed a monoexponential. This indicates in connection with the above results that for the short term separation only the components present in the plasma are removed and that the removal is described approximately by an open one compartment model. In the calculations of the eliminated amounts, the concentrations of the respective substances in the substitution fluid were taken into account. It is concluded, that for efficient detoxication by plasma exchange both the exchanged plasma volume and the size of the distribution space are important. Only for substances with a small distribution space, plasma exchange is efficient. In view of this, only minute amounts of digoxin have been removed during the treatment due to it's huge distribution space. However, due to the relatively small distribution space of the thyroid hormones, particularly of T4, the plasma membrane separation method is removing considerable amounts of thyroid hormone and can be useful in the management of thyroid storm.

49975 (INIS-mf—8137, pp vp) **I-123(131)-metyrapone for imaging of the adrenal cortex.** Zolle, I.; Bergmann, H.; Hoefer, R. (2. Med. Univ. Klinik, Vienna (Austria). Abt. fuer Nuklearmedizin); Robien, W. (Vienna Univ. (Austria). Inst. fuer Organische Chemie). 1982. NTIS (US Sales Only), PC A17/MF A01.

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Attempts to label metyrapone with radioiodine resulted in the synthesis of 4'-bromometyrapone that is labelled with I-123(131) by halogen exchange before use. The synthesis of I-123(131)-metyrapone involves 4 intermediate compounds. 4'-bromometyrapone serves as a precursor with indefinite shelf-life that is labelled selectively in the 4'-position of ring B. Studies of the biodistribution of I-131-metyrapone indicate the highest concentration in the adrenal gland 10-20 min after injection, peak uptake in the normal adrenal corresponds to 0.2% of the administered dose. In hyperfunctioning adrenals the uptake is higher. In a patient with bilateral modular hyperplasia, 0.8% of the injected radioactivity were measured in the enlarged adrenals at 2 resp. 2.8 hrs after injection of I-123-metyrapone. We have performed the first adrenal scintigram on the same patient with 1.25 mCi of I-123-metyrapone.

49976 (INIS-mf—8137, pp vp) **Clinical validity of combined radiocardiographic techniques in the diagnosis of coronary artery disease.** Bosiljanoff, P.; Becker, V.; Dohmen, W.; Motawe, M.; Feinendegen, L.E. (Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Medizin). 1982. NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

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It was the aim of this study to investigate the potential diagnostic advantages of combined data analysis of transit time, gated blood pool, and myocardial perfusion studies, with special regard to patients suffering from coronary artery disease.

49977 (INIS-mf—8137, pp vp) **Results of radioummunological estimation of parathormone before and after operation.** Schwartz, K.D.; Michael, R.; Pietsch, P.; Tredt, H.J.; Brietzke, W.; Dabels, J. (Schwerin (Germany,D.R.).:. 1982. (In German). NTIS (US Sales Only), PC A17/MF A01.

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Over a period of 3 years about 1.120 parathyroid hormone assays were carried out in 527 patients. Of these, 198 (38%) showed elevated serum levels. Feedback from referring institutions, where received, indicated that primary hyperparathyroidism was confirmed surgically in 42 cases. Of these, 6 had normal parathyroid hormone levels, while 36 showed minor to substantial elevations. In 24 patients parathyroid hormone was also determined in blood samples selectively obtained from the cervical veins. The results of 16 determinations agreed well with the clinical course and the surgical findings. In the remaining 8 cases surgical reports were inadequate or unavailable. The authors conclude from this evidence that parathyroid scanning with Se^{75} methionine appears to have no longer a place in localizing adenomas. The comparison of pre- and postoperative findings showed a mostly appreciable drop of parathyroid hormone serum levels after surgery which was consistent with the clinical course. Calcium concentrations were as high as or higher than preoperatively in 5 cases. This appears to suggest that calcium levels have a lower diagnostic potential at least in normocalcemic cases.

49978 (INIS-mf—8137, pp vp) **^{123}I-HDA and ^{201}Tl-chloride: A comparative study in coronary artery disease.** Mueller, G.; Hoeflin, F.; Noelpp, U.; Roesler, H. (Univ. Bern, Bern (Switzerland). Abt. fuer Nuklearmedizin); Lomazzi, U. (Univ. Bern, Bern (Switzerland). Kardiologische Abt.). 1982. NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

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By means of the 7-pinhole collimator technique 21 patients with CAD and 7 patients with acute myocardial infarction were examined scintigraphically both with 201-Tl and 123-I-Heptadecanoic acid. The results obtained with both tomographic techniques were concordant. MI's and scars are displayed in the same fashion as regions of diminished or absent accumulation of radioactivity. Some of the patients with acute MI present the defect in the fatty acid scintigram as cold-warm-lesion, i.e. diminished tracer accumulation in the early image and fill-in in the late image (so-called d-type-lesion). These lesions were not observed in cases of stress induced

ischemia. Therefore it is not possible to sustain hypothesis that these lesions correlate with borderline perfused myocardium.

49979 (INIS-mf—8137, pp vp) **Measurements of regional lung water with 0-15 labeled water and CO-15 labeled carboxyhemoglobin.** Helmeke, H.J.; Schober, O.; Lehr, L.; Junker, D.; Meyer, G.J.; Fitschen, J.; Bossaller, C.; Hundeshagen, H. (Medizinische Hochschule Hannover (Germany, F.R.). Abt. Nuklearmedizin und Spezielle Biophysik). 1982. NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

In Radioactive isotopes in clinic and research. Gastein international symposium 1982. Vol. 15, Pt. 2.

Determination of regional vascular lung water is only practicable by external imaging since it is the only method which allows analysis of many regions. 0-15 was produced by our medical cyclotron (MC-35) via the N-14(d,n)0-15 reaction and processed to H_2O-15 as the diffusible and to CO-15-hemoglobin autologous erythrocytes - as the intravascular tracer. The activity over both lungs applied as a bolus into the right atrium (5-10 mCi/1 sec) was followed by a positron camera (4200; Cycl. Corp.). Data acquisition and analysis was done in a pdp 11-55 computer system. Mean transit times were computed by the 'height over area' and the 'ratio of moments' method. The extravascular lung water per unit of plasma volume (ELW/Vp) was calculated according to Fazio et al. (1976).The lungs were divided into six zones. 47 investigations in 27 patients were carried out (controls, patients with heart failure, and critically ill with respiratory distress). As expected critically ill patients (ELW/Vp = 0.39+-0.19/0.66+-0.21) demonstrated a higher ELW/Vp than those suffering from myocardial insufficiency (ELW/V = 0.30+-0.13) or controls (ELW/Vp = 0.22+-0.11). Various factors involved in the measurement of lung water are mentioned. Because of methodological considerations and the worse discrimination concerning of the 'ratio of moments' method we prefer the 'height over area' analysis in the determination of transit times. The scintigraphic estimation of the so defind regional lung water is possible as the discrimination of groups is; the follow up or quantification of regional lung water of a patient in clinical routine work seems to be not yet established under the demonstrated conditions.

49980 (INIS-mf—8137, pp vp) **Detections of intravascular thrombi by indium-111 labelled platelets: means for testing the efficiency of antiagregants and anticoagulants.** Rigo-Betz, Ch.; Rigo, P.; Fillet, G.; Delandsheere, Ch.; Legrand, V.; Soyeur, D. (Hopital de Baviere, Liege (Belgium). Institut de Medecine). 1982. (In French). NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

In Radioactive isotopes in clinic and research. Gastein international symposium 1982. Vol. 15, Pt. 2.

Several authors have described the possibility to image intravascular thrombi after injection of In^{111} labelled platelets. Left ventricular thrombi occur frequently in patients with aneurysm; the incidence rate varies from 44 to 78% according to the different authors. This situation represents a model for testing the therapeutic efficacy of anticoagulants or antiaggregants. We studied 13 patients with left ventricular aneurysm. Five patients showed a fixation of labelled platelets 48 or 72 hours after injection. The presence of thrombi was confirmed by echocardiography or ventriculography in all cases. Eight patients were negative at scintigraphy. A thrombus could be identified by other methods in only one case. The incidence of thrombi seems to be higher in patients not receiving anticoagulants. Two patients with a left ventricular thrombus and no treatment were submitted to anticoagulant therapy and retested. The images remain unchanged in one case but in the other, the thrombus was no longer visible. In conclusion, scintigraphy with In^{111} labelled platelets is a valuable method for detecting left ventricular thrombi in aneurysm. It could be a method to appreciate anticoagulant or antiaggregant drug activity.

49981 (INIS-mf—8137, pp vp) **Estimation of hemodynamic blood flow after an arterial hectomia starting from the initial values of the cerebral blood deficit.** Philippon, B.L.; Vinard, E. (Hopital Cardiologique de Lyon, 69 (France)); Goutelle, P. (Hopital Neurologique, Lyon (France).). 1982. (In French). NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

In Radioactive isotopes in clinic and research. Gastein international symposium 1982. Vol. 15, Pt. 2.

In 37 patients eligible for carotic endarterectomy, regional cerebral blood flow (rCBF) was measured with a gamma camera after 133-Xenon inhalation. In all cases blood flow was determined bilaterally one week prior to and one week after surgery. Postoperatively, hemispheral blood flow on the operated side was found to be increased in 26 patients (over 70% of cases). The highest increase was +58%. Mean hemispheral flow on the diseased side rose from 33.6 +- 6.6 ml/-min/100g pre-operatively to 36.2 +- 6.4 after surgery. When evaluated Wilcoxon's test, the difference was found to be statistically significant at $p < 0.05$. Multiparametric regression analysis showed the relation to be most significant for the following variables: postoperative hemispheral flow changes on the operated side (Δ %), pre-operative hemispheral flow on the diseased side Di; pre-operative hemispheral flow on the contralateral side, Do;/pre-operative ratio between flow in the most severely ischemic zone (Di^-) and Di, Di^-/Di; (Δ = a - aiDi + aoDo + bDi^-/Di, r = 0.63, $p < 0.01$). The postoperative hemodynamic improvement can be expected to be substantial, if Di is low, Do is high and focal ischemia is severe. This Correlation is explainable by the reversibility of focal ischemia in these cases. The coifficients of Di and Do are attributable to collateral function, postoperative flow increases being considerable for poorly functional collaterals. The postoperative hemodynamic improvement can, at least to some extent, be predicted from the pre-endarterectomy values for rCBF alone.

49982 (INIS-mf—8137, pp vp) **Quantitative isotopes miction cystoureterography (QIMCU).** Szy, D.A.G.; Stroetges, M.W.; Funke-Voelkers, R. (Essen Univ. (Gesamthochschule) (Germany, F.R.). Abt. fuer Nuklearmedizin). 1982. (In German). NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

In Radioactive isotopes in clinic and research. Gastein international symposium 1982. Vol. 15, Pt. 2.

A simple method for a quantitative evaluation of vesicoureteral reflux was developed. It allows the determination of a) the volume of reflux b) the volume of the bladder at each point of time during the examination. The QIMCU gives an insight into the dynamic of reflux, of reflux volume, and of actual bladder volume. The clinical application in 37 patients with 53 insufficient ureteral orifices (i.e. reflux) showed that the onset of reflux occured in 60% as early as in the first five minutes of the examination but later in the remaining 40%. The maximal reflux was found only in 26% during the first five minutes. The reflux volume exceeded in more than 50% the amount of 3.5 ml. The international grading corresponds with the reflux volume determined by this method. Radionuclide cystoureterography can be used as well in childhood as in adults. Because the radiaction exposure is low, the method can be recommended for the initial examination and for follow up studies.

49983 (INIS-mf—8137, pp vp) **Clinical usefullness of ECG-triggered single photon emission computed tomography of blood-pool.** Eilles, Chr.; Boerner, W. (Wuerzburg Univ. (Germany, F.R.). Nuklearmedizinische Abt.); Strauss, P.; Gerhards, W.; Reiners, Ch. (Wuerzburg Univ. (Germany, F.R.). Medizinische Poliklinik). 1982. (In German). NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

In Radioactive isotopes in clinic and research. Gastein international symposium 1982. Vol. 15, Pt. 2.

ECT allows direct measurement of the volume of an organ and imaging without disturbing background-superposition. This makes ECT to an useful instrument for ECG-gated blood-pool

imaging. Acquisition is made after the injection of 25 mCi Tc-99m HSA with a rotating Anger-Camera-System. ECG-gated imaging is done for each projection; herewith 50-70 cycles per projection are added according to the phase of the heart-cycle. Transversal-Sections of the heart are reconstructed with filtered-back-projection. For each slice a representative cycle, consisting of 10-16 frames, is computed. As shown by our group before a good quality of the reconstructed images can be obtained. Comparison is made with the results of the ECG-gated blood-pool-ECT, the results of the conventional blood-pool-studies and with the results of Laevo-Cardiography.

49984 (INIS-mf—8137, pp vp) **Myocardial turnover rates of I-123 heptadecanoic acid (HDA) and I-123 p-phenylpentadecanoic acid (pIPPA).** Dudczak, R.; Kletter, K.; Frischauf, H.; Schmoliner, R.; Derfler, K. (Vienna Univ. (Austria). 1. Medizinische Klinik); Losert, U. (Vienna Univ. (Austria). 2. Chirurgische Klinik). 1982. NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

In Radioactive isotopes in clinic and research. Gastein international symposium 1982. Vol. 15, Pt. 2.

To improve data interpretation an extended data acquisition is proposed for myocardial studies with I-123 labeled fatty acids. Its feasibility was tested after intracoronary bolus injection of HDA in calves (n=3), and in patients after intravenous HDA or pIPPA application. Patients comprised 17 with coronary artery disease (HDA/14, pIPPA/3), 8 controls (HDA/6, pIPPA/2), and 2 cardiomyopathies (pIPPA). To prove the hypothesis that HDA reveals information on myocardial fatty acid metabolism, we examined if its elimination behaviour can be influenced by pharmacological interventions. In repeated studies in calves the influence of 4 hour halothan anesthesia, and in 4 patients the impact of insulin - glucose (I-G) infusion on the myocardial count rate was evaluated. The myocardial time activity curve was biexponential in animals and patient studies. With the assumption of a two compartment model the data seem to fit in known facts on myocardial fatty acid utilisation. It is demonstrated that pharmacological interventions as well as a diminished blood supply exert definite influence on turnover rates of I-123 labeled fatty acids. Anesthesia delayed HDA consumption. Infusion of I-G abolished β oxidation while esterification of HDA proceeds. Turnover rates of HDA and pIPPA were both prolonged in ischemic as compared to normal myocardium. This finding supports the assumption of an impaired fatty acid utilisation in the diseased heart. By compartmental analysis the relative amount of fatty acids which are incorporated into neutral lipids can be estimated, but their increase in diseased myocardium was not always accompanied by changes in the ratio of β oxidation. For studies of myocardial fatty acid metabolism HDA as well as pIPPA can be used as indicators, whose significance can be enhanced by extended data acquisition.

49985 (INIS-mf—8137, pp vp) **Low radiation angiocardiography with ultrashort-lived iridium-191m.** Treves, S.; Cheng, C.; Fujii, A. (Harvard Medical School, Boston, MA (USA)). 1982. NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

In Radioactive isotopes in clinic and research. Gastein international symposium 1982. Vol. 15, Pt. 2.

A new radipharmaceutical, iridium-191m (Ir-191m) was used for first pass radionuclide angiography (RAC) in 131 patients (pts) in the detection and quantitation of left-to-right shunts. Ir-191m has a physical half-life of 4.96 seconds and decays with 65 and 129keV photons. It is produced in an osmium-191 → iridium-191m generator. The patients ages ranged from 4 days to 67 years. (avg.=12.5 yr). Patients were referred with the diagnosis of ventricular septal defect, atrial septal defect, patent ductus arteriosus and other diagnoses. There was good correlation (r=.90) between Ir-191m RAC and simultaneous oxymetry at catherization in 20 pts. Ir-191m was useful to diagnose and quantify left-to-right shunts. In 17 pts, the pulmonary-to-systemic flow ratio (Qp:Qs) was 1.2 and in the rest 1.3 to 3.0. Advantages of Ir-191m RAC include low radiation dose, high counting statistics and the possibility of serial studies in a short time. Ir-191m RAC is safe, accurate and reproducible.

49986 (INIS-mf—8137, pp vp) **Method for estimation of the right dosis at radioiodine therapy.** Kimmig, B.; Lange, D.; Hermann, H.J. (Univ. Heidelberg, Radiologisches Zentrum, Heidelberg (Germany,F.R.). Abt. fuer Klinische Nuklearmedizin:. 1982. (In German). NTIS (US Sales Only), PC A17/MF A01.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982;

In Radioactive isotopes in clinic and research. Gastein international symposium 1982. Vol. 15, Pt. 2.

A scintillation camera equipped with a pinhole collimator was used to measure time-activity curves of patients undergoing a radiotherapy with I-131. The accuracy of activity measurement in metastases and of the measured halflife is better than +- 10%. The tumour dose can therefore be evaluated with an overall error of not more than +- 20%. This procedure is therefore much more reliable than hitherto known methods. Clinical results show: 1.) not all cases show an accumulation proportional to the activity administered, not even for very low accumulation. 2.) A reduced halflife was found for areas with high accumulation. Decrease was related to an absorbed dose in the range of 50.000 rads. Both effects 1) and 2) are responsible for a lower tumour dose than previously assumed. 3.) Even for very high accumulation tumour doses did not exceed 90.000 rads in the 22 patients. 4.) In some cases a further radiotherapy was refused because of the very low tumour dose that could be achieved.

49987 **(INIS-mf—8137) Radioactive isotopes in clinic and research. Gastein international symposium 1982.** Hoefer, R.; Bergmann, H. (Vienna Univ. (Austria). 1. Medizinische Klinik). 1982. 378p. NTIS (US Sales Only), PC A17/MF A01. Order Number DE83781075.

From Radioactive isotopes in clinic and research, Gastein international symposium 1982; Bad Gastein, Austria (1982).

Individual papers are abstracted separately for the data bases.

49988 **(INIS-mf—8144) Accuracy of abdominal lymph node scintigraphy in tumor diagnostics.** Kucharczyk, D. (Muenchen Univ. (Germany, F.R.). Fachbereich Medizin). 27 Jul 1978. 81p. (In German). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702791.

Thesis.

In view of the diagnostical correspondence between lymph node scintigraphy and X-ray lymphograpy, this dissertation, which is based on 110 systematic comparative evaluations, examines the diagnostical weight of the scintigraphic criteria for tumor growth, discusses diagnostical discrepancies and confirms the efficacy of lymph node scintigraphy in detecting malignomas. In discussing the diagnostical results in the light of previous experience, the shortcomings of the nuclear medical method in tumor diagnostics are shown to be attributable to the uncertainty of the individual scintigraphic criteria. Owing to the variability of the lymph node system as to topography, anatomy and retention rate and the fact that it cannot morphologically be well differentiated in the scintigram, X-ray lymphography to verify the scintigraphic result and preclude misinterpretation remains an indispensable measure.

49989 **(INIS-mf—8149) Elaboration of a radioligand receptor assay for TSH and thyroid-stimulating immunoglobulins.** Wille, A. (Muenchen Univ. (Germany, F.R.). Fakultaet fuer Medizin). 18 Dec 1980. 65p. (In German). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702769.

Thesis.

^{125}J-TSH is bound by membrane preparations from human thyroid glands. The removal of the radioactive hormone from the bond, interpreted by means of a standard curve, is an indicator of the unknown quantity of TSH or TSI. The specific binding of the TSH to the membrane proceeds as a function of hydrogen ion concentration, temperature, and incubation time. Since all globulins exhibit an unspecific binding to the membranes, it is necessary to separate the gamma globulin fraction from the serum in order to detect the TSI. The separation is achieved by QAE Sephadex A-50 columns. The displacement characteristics of the gamma globulin fractions are determined in the radioligand receptor assay. The clas-

sification into normal and pathological findings is done in accordance with the TSI index of Smith and Hall. The poor detection of TSI in the sera studied is attributed to the fact that the group of patients of this study had already been treated at the time the blood sera were taken. The TSH content of homogenates from human, postmortally taken pituitary glands is determined by the RRA and compared with the TSH values of the RIA. The comparison shows a positive correlation, with the TSH data of the RRA being above those of the radioimmunoassay. (orig./MG).

49990 **Process and device for x-ray system quality assurance.** Van Pelt, W.F.; Peterson, R.W. US Patent Application 6-440,728. 10 Nov 1982. 19p.

This invention relates to medical radiography test systems, and more particularly to a method and apparatus for providing evaluation of a medical or dental x-ray system consisting of x-ray generator, film and processor on a daily basis and to thereby assure the production of useful radiographs from the system with no need to repeat patient exposure because of problems with the x-ray system.

49991 **Replacement of radium by after-loaded artificial radionuclides for treatment of human tumours. Physical considerations, technical advances and some clinical results.** Paine, C.H. Oxford, England; Oxford University (1980). 54p. Available from British Library, Boston Spa, Wetherby, West Yorks. No. D36493/82.

Thesis.

The thesis is concerned with the author's work in the field of surface mould therapy and interstitial therapy in comparison with electron beam treatments. Technical developments and radiation dosimetry are considered, with particular reference to work in Oxford 1971-78, and to the clinical techniques of Pierquin in Paris. The following radionuclides are considered:- Radium-226, Caesium-137, Tantalum-182, Iridium-192, Californium-252, Radon-222, Gold-198, and Iodine-125.

49992 **Radioimmunoassay for gastric inhibitory polypeptide.** Alam, M.J. Bposton, Spa, England; British Library, Boston Spa, Wetherby (1979). 220p. Available from British Library, Boston Spa, Wetherby, West Yorks. No. D36594/81.

Thesis.

In this thesis, an attempt has been made to establish a reliable and reproducible RIA for gastric inhibitory polypeptide (GIP) and to study the role of GIP in health and diseases including maturity onset diabetes, dumping syndrome and cystic fibrosis.

5507 Microbiology

REFER ALSO TO CITATION(S) 48779, 48783, 48784, 48785, 48788, 48789

49993 **(DOE/EV/04568—38) New techniques for growing anaerobic bacteria: Experiments with Clostridium butyricum and Clostridium acetobutylicum.** Adler, H.I.; Crow, W.D.; Hadden, C.T.; Hall, J.; Machanoff, R. (Oak Ridge National Lab., TN (USA); Tennessee Univ., Oak Ridge (USA). School of Biomedical Sciences). 1983. Contract AS05-76EV04568;W-7405-ENG-26. 19p. (CONF-830567—5; ORO—4568-38). NTIS, PC A02/MF A01. Order Number DE83015027.

From 5. symposium on biotechnology for fuels and chemicals; Gatlinburg, TN, USA (10 May 1983).

Stable membrane fragments derived from Escherichia coli produce and maintain strict anaerobic conditions when added to liquid or solid bacteriological media. Techniques for growing Clostridium butyricum and Clostridium acetobutylicum in membrane containing media are described. Liquid cultures initiated by very small inocula can be grown in direct contact with air. In solid media, colonies develop rapidly from individual cells even without incubation in anaerobic jars or similar devices. Observations on growth rates, spontaneous mutations, radiation and oxygen sensitivity of anaerobic bacteria have been made using these new techniques.

49994 (SERI/CP—231-1924, pp 91-103) **Physiology and biochemistry of the interactions of methanogenic bacteria with fatty acid producers and utilizers as an approach to increasing the rate and yield of methanogenesis.** LeGall, J. (Univ. of Georgia, Athens). Mar 1983. NTIS, PC A06/MF A01. (CONF-821249—).

From SERI anaerobic digestion program review meeting on fuel gas production from animal and agricultural residues and biomass; Golden, CO, USA (6 Dec 1982).

The main objective is to study the acetate and fatty-acid oxidizing microorganisms (acetogens and acetate utilizing methanogens) with the goal of increasing both the rate and yield of methane formation from biomass. This overall objective will be accomplished by: (1) isolating new types of these organisms and studying their nutritional requirement for optimum growth; (2) studying the physiology and the biochemistry of the organisms involved; (3) attempting to co-culture the organisms with methanogens and establishing the parameters for optimum growth; and (4) validating the test tube results in fermentors. Accomplishments this reporting period include the isolation of anaerobic organisms from freshwater lakes, microbial mats, sewage sludge, and rumen fluid. Physiology and biochemistry studies were performed on laboratory strains (D. vulgaris, D. gigas, Methanosarcina barkeri, Methanobacterium thermoautotrophicum) with specific attention to the need for metals (iron, nickel, cobalt, molybdenum, and sulfur). (DMC)

49995 (SERI/CP—231-1924, pp 105-109) **Study of methanogens by genetic technique.** Baresi, L. (Jet Propulsion Lab., Pasadena, CA). Mar 1983. NTIS, PC A06/MF A01. (CONF-821249—).

From SERI anaerobic digestion program review meeting on fuel gas production from animal and agricultural residues and biomass; Golden, CO, USA (6 Dec 1982).

Methanogenesis represents the terminal step in the degradation of organic matter in the absence of oxygen and sulfate and is carried out by a special group of organisms referred to as methanogens. Analysis of the terminal step in organic degradation has been hampered by the extreme cultural conditions necessary to maintain and grow the methanogenic bacteria. Application of genetics to the methane producing bacteria may prove beneficial. The objective of the second year's work will be to continue genetic characterization of two strains of methane producing bacteria. This will be accomplished by: continued isolation and description of nutritional and BES mutants of Methanococcus voltae; isolation of nutritional (amino acid) and BES mutants of Methanobacterium thermoautotrophicum; if satisfactory mutants are obtained, testing for conjugation and DNA transformation; and initiating a search for phages capable of infecting methanogenic bacteria.

49996 **(SI-R—770803-3) Analysis of petroleum hydrocarbons in intertidal organisms exposed to Ekofisk crude oil.** Lichtenthaler, R.G.; Oreld, F. (Sentralinstitutt for Industriell Forskning, Oslo (Norway)). Jul 1981. 40p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83750965.

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Aliphatic and aromatic hydrocarbons in intertidal organisms (Patella vulgata, Nucella lapillus and Balanus balanoides) exposed to Ekofisk (North Sea) crude oil were analysed. The organisms sprayed with petroleum accumulate both types of hydrocarbons. Highest levels of hydrocarbons are found in Balanus balanoides, lowest levels in Nucella lapillus. Rapid release takes place after the exposure has been terminated. The rate of depuration is fastest in the first 6-9 days. 19 drawings, 8 tables.

49997 **(SI-R—790917-3) Determination of sulfate reducing bacteria in sea bottom samples.** Eidsaa, G.; Stranger-Johannesen, M. (Sentralinstitutt for Industriell Forskning, Oslo (Norway)). Sep 1980. 26p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83750966.

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The content of sulfate reducing bacteria (SRB) and other microorganisms was determined in sea bottom drilling samples, taken close to the Ekofisk-Emden Pipeline in the North Sea. Both aerobic and facultative anaerobic bacteria and the anaerobic SRB were found in most of the samples in varying amounts. The SRB-content

was very high in the top layer of the sea bottom and in areas close to the pipe when the pipe was exposed. No microorganisms could be cultured from undisturbed sediments at greater depths than 0,5 m. This is in agreement with earlier investigations of other sea bottom samples. The sediments from this sampling area contained considerably higher amounts of bacteria, especially SRB, than earlier investigated sediment samples from more northern parts of the North Sea. SRB and other bacteria are known to cause corrosion of metals. Bacteria can also deteriorate other materials, used as protectives. It is, however, difficult to estimate or predict a possible deteriogenic influence on the pipe, as this depends both on the protection of the pipe and the potentialities for further microbial activity. Based on a ranking system of environmental data the seabed outside Emden has earlier been characterized as a region with very high risk for microbial corrosion compared with other parts of the North Sea. 7 drawings, 1 table.

5510 Physiological Systems

REFER ALSO TO CITATION(S) 48542, 49974

5520 Public Health

49998 **(ORNL—5980) Estimation of relative risk using prevalence and mortality data in case-control studies.** Calle, E.E.; Zeighami, E.A.; Morris, M.D. (Oak Ridge National Lab., TN (USA)). Aug 1983. Contract W-7405-ENG-26. 124p. NTIS, PC A06/MF A01. Order Number DE83016459.

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The bias in the odds ratio (OR) created by using prevalence or mortality rather than incidence in case-control studies has been estimated for four study designs: prevalent case, living controls; decedent cases, living controls; decedent cases and controls; and decedent cases, decedent controls with misclassification. Expected OR's were estimated by repeated random sampling of cases and age-matched controls from underlying exposed (E) and nonexposed (anti E) simulated life table populations. Bias, the divation of E(OR) from the ratio of the input incidence rates (RR/sub INC/), was regressed on mortality from other causes among the nondiseased, mortality among the diseased, proportion of the diseased dying from other causes, disease incidence, and the differences in these factors between E and anti E. This methodology enables the prediction of both magnitude and direction of bias for the different case-control study designs and under different disease and population conditions. It has resulted in usable regression models to predict bias and a set of guidelines for epidemiologic investigators. The models and guidelines enable an assessment of the adequacy of substituting prevalence or mortality data for incidence data when conducting, or interpreting the results of, a case-control study.

5530 Agriculture And Food Technology

REFER ALSO TO CITATION(S) 48542, 49919, 49920, 49921, 49922, 49923, 49924, 49925, 49926, 49929, 49951, 50064, 50069

49999 **(IAEA-TECDOC—267) Use of isotopes to detect moderate mineral imbalances in farm animals. Results of a co-ordinated research programme on the use of isotope techniques for detection of moderate mineral imbalances in farm animals organized by the Joint FAO/IAEA Division of Isotope and Radiation Applications of Atomic Energy for Food and Agricultural Development and presented at a research co-ordination meeting held in Nicosia, Cyprus, 6-10 October 1980.** (Joint FAO/IAEA Div. of Isotope and Radiation Applications of Atomic Energy for Food and Agricultural Development, Vienna (Austria)). Sep 1982. 194p. (CONF-8010327—). NTIS (US Sales Only), PC A09/MF A01. Order Number DE83702409.

From Research co-ordination meeting on the use of isotope techniques for detection of moderate mineral imbalances in farm animals; Nicosia, Cyprus (6 Oct 1980).

The publication comprises 12 articles of which 10 have been selected for inclusion in INIS. Their topic is the use of tracer techniques in studying the metabolism of trace amounts of mineral elements in domestic animals.

50000 **Use of radioisotopes in studying factors responsible for alfalfa resistance to bacterial wiltxng.** Hanker, I.; Kudelova, A. (Vyzkumne Ustavy Rostlinne Vyroby, Prague (Czechoslovakia). Ustav Ochrany Rostlin). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

Studies are summarized dealing with possible causes of vascular dysfunction and resistance of alfalfa to bacterial wilting caused by Corynebacterium insidiosum (McCull.) H.L. Jens from the physiological and biochemical points of view. Using ^{32}P, ^{35}S, ^{54}Mn, ^{45}Ca, ^{65}Zn, and ^{86}Rb the uptake, distribution, translocation, and metabolism of these elements in plants with a different resistance against diseases were investigated. The possible use is discussed of ^{86}Rb as a tracer of potassium. The results suggest that the resistance of alfalfa to bacterial wilting is probably determined by several factors.

50001 **Use of radioisotopes in study of herbicide effect mechanism.** Bergmannova, E.; Taimr, L. (Vyzkumne Ustavy Rostlinne Vyroby, Prague (Czechoslovakia). Ustav Ochrany Rostlin). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

The degradation of ^{35}S-prometryne in 8 agricultural crops and 3 woody species is explained. S released from the -SCH_3 group was incorporated into cystine, a sulphate anion, and in plants from the family Brassicaceae into sinalbin and glucobrassicin. The main cause of resistance of Convolvulus arvensis to atrazine (labelled on rings with ^{14}C) was its ability to degrade atrazine into non-toxic metabolites (hydroxyatrazine, conjugate with glutathione). Bidisin, Isobarnon and Suffix decreased the uptake, transport, and metabolism of phosphorus (^{32}P), calcium (^{45}Ca) and potassium (^{86}Rb) in Avena fatua; they are used for its killing. In barley and wheat no decrease was observed with the exception of a limited transport of potassium in the youngest leaf. Bidisin and Isobarnon inhibited the fixation of $^{14}CO_2$ in A. fatua within 2 hours after application.

50002 **Use of beta absorption in studies on non-steady state water flows in bean leaves (Phaseolus vulgaris L.).** Fojtik, L. (Vysoka Skola Zemedelska, Prague (Czechoslovakia)); Zamecnik, J. (Vyzkumne Ustavy Rostlinne Vyroby, Prague (Czechoslovakia). Ustav Genetiky a Slechteni). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

The calibration and use of beta absorption for the determination of water flows in excised and intact leaves of Phaseolus vulgaris are described using a simple model of beta radiation absorption by leaves. In excised leaves, water content decreased first in vessels and thereafter in mesophyll cells; this was obviously associated with a quicker decrease in water potential in the mesophyll. In intact leaves saturation flows were studied at different temperatures of roots, zero transpiration, and at the same initial water deficit. An increase in temperature from 4 degC to 28 degC was associated with an 11-fold increase in water flow. This markedly increased water uptake was probably associated with an increased root metabolism.

56 BIOMEDICAL SCIENCES, APPLIED STUDIES

5601 Radiation Effects

REFER ALSO TO CITATION(S) 48738, 49855, 49859, 49861, 49862, 49906, 49907, 49914, 49939, 49940, 49950, 49993, 50063

50003 **(AD-A—125716/1) Delayed effects of proton irradiation in Macaca mulatta. II. Mortality (15-year report). Interim report 1964-1982.** Yochmowitz, M.G.; Wood, D.H.; Salmon, Y.L. (School of Aerospace Medicine, Brooks AFB, TX (USA)). Jan 1983. 58p. (SAM-TR—83-2). NTIS, PC A04/MF A01.

A radiation primate colony of 57 controls and 301 (217 proton) exposed subjects has been followed since 1964. Lifespan of both the exposed and, more specifically, the proton-exposed subjects in the chronic colony was shortened. Energies of 55 MeV and greater decreased life span as did doses in excess of 360 rads. Females were more sensitive to lower doses than males. They died earlier in doses as low as 25-113 rads and in all energies tested except 55 MeV. Survival curve analysis found no difference among the onset of death in the 3 highest energies (138, 400, and 2300 Mev); however, its onset was earlier in the 32-MeV exposure and later in the 55-MeV exposure and later in the 55-MeV exposure than the total penetrating energies (greater than or equal to 138 MeV). Dose ordering effects were evident. In contrast to the controls, mortality rates began to accelerate at approx. 8 years in the 360-400-rad group; at approx. 2 years in the 500-650-rad group and approx. 1 year in the 800-rad group. The leading causes of death among the proton-exposed animals were primary infections (approx. 30%), endometriosis (25%), and organ degeneration (approx. 17%). Malignant tumors accounted for 18% of the deaths. If endometriosis is included in this group, the mortality from all forms of neoplastic conditions is 43% in the proton-exposed animals.

50004 **(CONF-830782—1) Repair of neoplastic transformation damage following protracted exposures to ^{60}Co γ-rays.** Han, A.; Hill, C.K.; Elkind, M.M. (Argonne National Lab., IL (USA)). 1983. Contract W-31-109-ENG-38. 17p. NTIS, PC A02/MF A01. Order Number DE83015684.

From 11. L. H. Gray conference on cellular repair of radiation damage - mechanisms and modifying agents; Glasgow, UK (18 Jul 1983).

The incidences of neoplastic transformation induced by ^{60}Co γ-rays in exponentially growing mouse embryo 10T1/2 cells were measured following acute and protracted exposures. Delivery of ^{60}Co γ-rays at a low dose rate (0.1, 0.5, 2.5 rad/min) compared with a high dose rate (100 rad/min) results in appreciable, dose rate dependent reductions in cell killing and, independent of the effect on cell survival, reduces significantly the incidence of neoplastic transformation. Exposure of exponentially growing 10T1/2 cells to a dose of γ-rays in five equal daily fractions also significantly reduces transformation frequency, compared with delivery in a single dose, throughout the dose range examined (25 to 300 rads). The initial parts of the induction curves are fitted quite well by a linear dose dependence. The slopes of the regression lines for multifractionation delivery or irradiation at 0.1 rad/min, are one-third and one-half, respectively, of those for single exposures at a high dose rate. Increasing the interfraction interval up to 48 hours, or reduction of the dose per fraction further reduce incidence of neoplastic transformation. We conclude that protracted exposures of low LET radiation result in a net error-free repair of subtransformation damage.

50006 **(DOE/EV/03571—T2) Biological effects of DNA repair, including mutagenesis. Progress report, August 15, 1982-August 1, 1983. COO-3571-23.** Hutchinson, F. (Yale Univ., New Haven, CT (USA)). 1983. Contract AC02-76EV03571. 13p. NTIS, PC A02/MF A01. Order Number DE83015969.

The research supported by this contract for the period covered by this report has concerned mechanisms in mutagenesis. Specifically, the work has been aimed at determining the lesions in DNA formed by particular mutagenic agents which lead to mutations, and to characterization of the pathways by which these lesions lead to changes in the sequence of bases in the genomic DNA.

50008 **(ECN—125) From body burden to effective dose equivalent. Part 2.** Keverling Buisman, A.S. (Stichting Energieonderzoek Centrum Nederland, Petten). 1982. 59p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702319.

A compact set of data is presented for the evaluation of measurements performed with a whole body counter. For each nuclide the following information is collected: physical halflife; metabolic data; the relation between chemical compound and inhalation class; the fraction of intake in the human body at 18 points in time after a single intake; the relation between intake and effective committed dose equivalent; the equilibrium body burden following continuous intake; the relation between a constant body burden and dose-equivalent rate. This report is an extension of an earlier paper (ECN-116). It completes the list of nuclides, i.e. apart from noble gas nuclides almost all nuclides with a physical halflife exceeding 12 hours have been considered, either in this paper or in part I.

50007 (IA—1375, pp 200-201) **Comparison of the influence of two different separation techniques on the human lymphocyte morphology and sensitivity to gamma radiation.** Kol, R.; Riklis, E. (Israel Atomic Energy Commission, Tel Aviv); Friedlander, M.; Raveh, D. (Ben-Gurion Univ. of the Negev, Beersheba (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

50008 (IA—1375, pp 203) **DNA repair synthesis in carrot root tissue irradiated with ultraviolet light.** Degani, N. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

50009 (IA—1375, pp 196-198) **Effects of very low gamma radiation doses on the reproductive system of male rats.** Canfi, A. (Israel Atomic Energy Commission, Tel Aviv); Bedrak, E. (Ben-Gurion Univ. of the Negev, Beersheba (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

50010 (IA—1375, pp 198-199) **Gamma irradiation induced effects on the reproductive system of female rats.** Freud, A. (Israel Atomic Energy Commission, Tel Aviv); Bedrak, E. (Ben-Gurion Univ. of the Negev, Beersheba (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

50011 **(IAEA-R—2347-F) Assessment in rodents of the pathological and immunopathological consequence of multiple vaccinations and challenge with radiation-attenuated malaria parasites (blood forms and sporozoites). Final report for the period 1 May 1979 - 31 May 1982.** Boonpucknavig, S. (International Atomic Energy Agency, Vienna (Austria)). Jun 1982. 78p. NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702318.

Multiple vaccination with irradiated merozoites of Plasmodium berghei resulted in high levels of circulating antibody but a low degree of protection to challenge with normal merozoites. On the other hand, the multiple vaccinations and the challenge resulted in severe immunopathological reactions shortly after the immunization or challenge. These reactions were seen in the liver, kidneys and spleen and included the accumulation of mononuclear cells, severe coagulative necrosis of liver cells and proliferative changes in the splenic white pulp and in the glomeruli. The pathological reactions were more severe than in non-immunized animals but the parasitemia was lower and less malarial antigen was detected in Kupfer Cells of the liver, the sinusoidal cells of the spleen and the reticuloendothelial cells in the interstitial tissue of the kidney. Vaccination with irradiated sporozoites of P. berghei resulted in good protection to challenge with normal sporozoites even before circu-

lating anti-sporozoite antibody could be detected. Only mild pathological changes were associated with up to 4 immunizations followed by challenge and these were largely limited to the liver, and were reversible. Sporozoite antigens were detected in the spleen and immune complexes in the glomeruli for 2-4 weeks following challenge but not later. Immunized mice however often developed some lobular pneumonia of the lung but the severity of this did not increase with challenge.

50012 (IAEA-TECDOC—266, pp 21-28) **Natural radioprotection of cells. Radiochemical, biochemical and clinical aspects.** Revesz, L. (Kungliga Karolinska Mediko-Kirurgiska Inst., Stockholm (Sweden)). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

Recent investigations on natural radioprotection are reviewed, carried out with human fibroblast strains and lymphoblastoid cell lines derived from individuals heterozygous or homozygous with regard to an inborn error in glutathione synthetase activity. The cells have a decreased content of non-protein bound sulphydryls and lack specifically glutathione either almost totally, or have a glutathione level about fifty per cent of the normal. Using single-strand DNA breaks as the end-point of the radiation effect, oxygen and misonidazole fail to enhance the radiosensitivity of cells deficient in glutathione, and OER and DMF close to unity are calculated. Substitution of glutathione deficiency by treatment with different radioprotective aminothiols decreases the sensitivity of the cells, and makes them susceptible to the oxygen effect. In glutathione deficient cells, rejoining of the single strand breaks proceeds at a normal rate after anoxic radiation exposure, but is inhibited after oxic exposure. Using clonogenic survival as the end-point for the radiation effect, sensitization of glutathione deficient cells is again greatly decreased, but OER and DMF differ significantly from unity. The data were interpreted to indicate that endogenous glutathione or some exogenous aminothiols repair radiation induced radicals in key target molecules by hydrogen transfer in a competition with oxygen and/or misonidazole which permanent the damage. The outcome of the radical reactions will be modified by further post-irradiation enzymatic repair processes of which at least one is glutathione dependent. For the appropriate clinical application of hypoxic cell sensitizers, the use of a "vascularization index", possibly determined by morphometric analysis of histological preparations, is suggested as a diagnostic parameter to characterize neoplasms besides current routine staging and grading of differentiation.

50013 (IAEA-TECDOC—266, pp 63-69) **Radiosensitization of hypoxic cells treated with some imidazole derivatives.** Mori, T.; Murayama, C. (Tokai Univ., Isehara, Kanagawa (Japan). School of Medicine); Hori, H.; Inayama, S. (Keio Univ., Tokyo (Japan). School of Medicine). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

Extensive investigations to seek more effective and less toxic radiosensitizers to hypoxic cells than misonidazole were carried out. It has been considered that the neurotoxicity of misonidazole was mainly due to the nitro substituent which is bonded to the imidazole ring. Instead of the nitro group, many types of sulfur group were introduced to the imidazole ring. Usually the radiosensitizing ability of the compound is supposed to be related to the electron affinity. Therefore, as an indicator of the electron affinity, the lowest unoccupied molecular orbital (LUMO) level of these compounds was determined by the MO calculation using the CNDO/2 method. The LUMO level of these compounds was almost the same as that of misonidazole. Expecting good radiosensitizing effect of these compounds, the radiation enhancement ratio to the hypoxic cells was tested in vitro. To get the hypoxic cells in vitro, HeLa S3 cells were flushed by 95% N_2 + 5% CO_2 gas in minimum essential medium. The oxygen enhancement ratio (OER) was measured at about 3 in this system. Unfortunately, the sulfur compounds have no radiosensitization to the hypoxic cells. Since the radiosensitizing ability seemed not directly to be related to the electron affinity and the radiosensitizing effect of misonidazole must be mainly due to the nitro substituent, certain dinitroimidazole derivatives (e.g. 2.4-dinitroimidazole-1-ethanol) were further studied for the screening test. It was found that this compound had a radiosensitizing effect on the hypoxic cells about ten times greater than misonidazole. The cytotoxicity of this compound was also investigated in our hypoxic system and it was found to have twice as much as misonidazole. Further investigation of this compound is necessary to apply animal experiments and clinical use.

50014 (IAEA-TECDOC—266, pp 77-86) **Increased tumor curability by radiotherapy combined with PLDR inhibitors in murine cancers.** Nakatsugawa, S.; Ono, K.; Nishidai, T.; Yukawa, Y.; Takahashi, M.; Abe, M. (Kyoto Univ. (Japan). Faculty of Medicine); Kumar, A. (Himachal Pradesh Univ., Simla (India). Dept. of Bio-sciences); Sugahara, T. (National Hospital of Kyoto (Japan)). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

The present research strategy for the improvement of radiotherapy of radioresistant tumors includes high LET radiations, combined use of chemotherapy, hypoxic cell sensitizers and the use of hyperthermia with radiations. A new approach utilizing PLD repair inhibition following radiotherapy is shown to be another possibility of the improvement with an exciting new prospect. Screening of PLD repair inhibitors in vitro was done using stationary phase of Chinese hamster HA-1 cells. Among the nucleoside analogues tested, four chemicals, that is, 3'-deoxyadenosine (3'-dA), 3'-deoxyguanosine (3'-dG), β-D-arabinofuranosyl adenine (ara-A) were found to be more effective than 3'-deoxypyrimidine nucleosides. Even among selected PLD repair inhibitors, 3'-dA and ara-A were more cytotoxic than the others. Encouraged with the above results, experimental radiotherapy was done using intradermally transplanted EMT-6 tumors in BALB/c female mice (8 weeks). When the tumor reached 5.5-8.0 mm diameter in size, they were locally irradiated with 32 MeV electron beam. TCD50/120 assay was adopted to evaluate the drug effects. The drugs (100 mg/kg) were intraperitoneally injected immediately after irradiation. E.R. (enhancement ratio) were 1.5 for 3'-dA, 1.9 for 3'-dG and 2.2 for 7904 respectively. Enhancement of anti-tumor drug effects was also observed with treatment bleomycin, FT-207 (a derivative of 5-FU) and ara-C by 3'-dG in EMT-6 tumors. Thus, PLD repair inhibitor might be useful for tumor eradication not only by radiotherapy but also by chemotherapy.

50015 (IAEA-TECDOC—266, pp 137-142) **Recurrent interest in the recent research in experimental cancer therapy in vitro.** Kano, E.; Tsubouchi, S.; Kondo, T.; Inui, M. (Department of Experimental, Radiology and Health Physics, School of Medicine, Fukui Medical Univ. (Japan)); Miyakoshi, J.; Furukawa, M.; Heki, S.I. (Kyoto Coll. of Pharmacy (Japan)). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

Since Arrhenius plot for hyperthermic cell killing bends at about 42.5 deg. C, the mode of action would be different between ranges of temperature above and below 42.5 deg. C. Hyperthermias above and below 42.5 deg. C are generally called high and low hyperthermias respectively. A mode of duplicated heatings, i.e. preceded high hyperthermia followed by low hyperthermia is called step down heating, while the reverse sequence of the duplicated heatings is called step up heating. Step down heating is remarkably more effective for cell killing than step up heating. Cells preheated by high hyperthermia are sensitized to low hyperthermia, while cells preheated by low hyperthermia show reduced sensitivity to high hyperthermia. Combined treatments of heat and X-rays show hyperthermic radiosensitization as appeared in reduced D_0 value. Sequences of treatments with heat and X-rays show no apparent difference, while combined treatments of step down heating and X-rays show more hyperthermic radiosensitization than those of step up heating and X-rays. Thermotolerance is induced in fractionated step up heating, in which the 37 deg. C interval is interpolated between the low and high hyperthermia. The thermotolerance is maintained for the first two hours of the 37 deg. C interval. On the other hand, thermosensitization is induced in fractionated step down heating in which the 37 deg. C interval is interpolated between high and low hyperthermia. The thermosensitization is main-

tained for about 7 hours of the 37 deg. C interval. Radiosensitization obtained by preceeded high hyperthermia disappears for the first two hours of the 37 deg. C interval prior to the X-rays, and complete disappearance of the radiosensitization is performed at 24 hours of the 37 deg. C interval. Step down heating is more efficient than step up heating in the hyperthermic radiosensitization.

50016 (IAEA-TECDOC—266, pp 185-194) **Selective thermal neutron capture therapy of cancer cells using their specific metabolic activity.** Mishima, Y.; Ichihashi, M.; Nakanishi, T.; Tsuji, M.; Nakagawa, T. (Kobe Univ. (Japan)). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

Thermal neutrons are absorbed easily by ^{10}B resulting in the emission of α-particles and lithium atoms, which share an energy of 2.3 MeV, and have a travelling range of 14 μm. This is equal to the diameter of melanoma cells. Therefore if we can selectively accumulate ^{10}B in melanoma cells, we can destroy them without serious injury to the surrounding tissue. We have synthesized ^{10}B compounds having a selective affinity for melanoma cells, such as $^{10}B_1$-chlorpromazine ($^{10}B_1$-CPZ), ^{10}B sodium undecahydrododecaborate ($^{10}B_{12}$-CPZ), and $^{10}B_1$-p-boronophenylalanine ($^{10}B_1$-BPA). We irradiated melanoma subcutaneously proliferating in hamster. The maximum and longest suppressive effect has been obtained by neutron and administration of $^{10}B_{12}$-CPZ or $^{10}B_1$-BPA before irradiation, compared to neutron alone and to X-ray treatment. The enhanced melanoma killing effect of the ^{10}B-compounds is also shown by in vitro radiobiological analysis. The D_0 value of thermal neutron only is 2.8×10^{12} nvt, ^{10}B-boric acid, 5 μg ^{10}B present: 0.9×10^{12} nvt; $^{10}B_{12}$-CPZ, 1.2 μg ^{10}B pre-incubation: 0.9×10^{12} nvt; and $^{10}B_1$-BPA, 0.38 μg ^{10}B pre-incubation: 0.9×10^{12} nvt. The chemical assay of melanoma bearing hamsters revealed a ^{10}B tumor to blood ratio of 11.5 and a tumor to liver ratio of 15, twenty-eight hours after administration. Pre-clinical experiments on spontaneous melanoma in Duroc pig skin have shown marked regression and depigmentation after the combined treatment of $^{10}B_1$-BPA and irradiation, without obvious side effects.

50017 (IAEA-TECDOC—266, pp 109-116) **Biological properties of particle radiations.** Sakamoto, K. (Tohoku Univ., Sendai (Japan). School of Medicine); Okada, S. (Tokyo Univ. (Japan). Faculty of Medicine); Lam, G.K.Y. (British Columbia Univ., Vancouver (Canada). TRIUMF Facility); Howard, J. (California Univ., Berkeley (USA). Lawrence Berkeley Lab.). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

Squamous carcinomas in WHT/Ht mice were exposed to fast neutrons, protons, negative pi-mesons and neon ions. The biological effects of these particle radiations were compared with those of 250 kV X-ray. The surviving fraction of epithelioma cells irradiated in vivo was studied using the TD50 assay. RBE values for particle radiations were calculated from the ratio of X-ray's and these particles' D_0 values. The RBE values of fast neutron were 2.2 for oxic cells and 2.8 for hypoxic cells, the RBE of protons were 1.0 for both oxic and hypoxic cells. The RBE of pions were shown different values among pre-peak, proximal peak and distal peak positions, namely they were 1.6 at distal peak, 1.3 at proximal peak and 1.0 at pre-peak plateau for oxic cells, 2.1 at distal peak, 1.5 at proximal peak and 1.0 at pre-peak plateau for hypoxic cells. In neon ions, the RBE were 1.6 at peak and 1.1 at pre-peak plateau for oxic cells, 2.3 at peak and 1.3 at pre-peak plateau for hypoxic cells. The PLD repairs of cells exposed to fast neutrons, pi-mesons and neon ions were not so remarkable compared with 250 kV X-rays.

50018 (IAEA-TECDOC—268) **Semi-dwarf cereal mutants and their use in cross-breeding. Proceedings of a research co-ordination meeting organized by the Joint FAO/IAEA Division of Isotope and Radiation Applications of Atomic Energy for Food and Agricultural Development and held in Vienna, 2-6 March 1981.** (Joint FAO/IAEA Div. of Isotope and Radiation Applications of Atomic Energy for Food and Agricultural Development, Vienna (Austria)). Jul 1982. 138p. (CONF-8103168—). NTIS (US Sales Only), PC A07/MF A01. Order Number DE83702408.

From Research co-ordination meeting on semi-dwarf cereal mutants and their use in cross-breeding; Vienna, Austria (2 Mar 1981).

The proceedings include 12 papers presented at the Research Co-ordination Meeting organized by the Joint FAO/IAEA Division of Isotope and Radiation Applications of Atomic Energy for Food and Agricultural Development and held in Vienna, 2-6 March 1981. At the meeting, participants reviewed the present status of genetic studies and several aspects of breeding for semi-dwarf plant type in cereals, discussed methods of evaluating semi-dwarfing genes for use in cross-breeding programmes and took decisions regarding future work plans. Nine papers give information on radiation induced semi-dwarf mutants of wheat, barley and rice and are input into INIS.

50019 (IAEA-TECDOC—268, pp 25-37) **Evaluation and genetic analysis of semi-dwarf mutants of wheat.** Konzak, C.F. (Department of Agronomy and Soils and Program in Genetics, Washington State Univ., Pullman, WA (USA)). Jul 1982. NTIS (US Sales Only), PC A07/MF A01. (CONF-8103168—).

From Research co-ordination meeting on semi-dwarf cereal mutants and their use in cross-breeding; Vienna, Austria (2 Mar 1981).

Large numbers of semi-dwarf (reduced height) mutants have been recovered over the 20 years we have been inducing mutations. Because of our need to emphasize practical breeding goals, few of the mutants have yet been subjected to genetic analyses. Efforts to modify and improve some of the mutant semi-dwarf plant types for use in breeding are continuing, as are experiments to induce new reduced height mutants in advanced breeding lines. Radiation induced mutant, Burt M 937 (CI 15076) carries a recessive reduced height gene designated rht_4. Gene rht_4 is independent of Rht_1 and Rht_8 of spontaneous origin. EMS mutant Marfed M 1 (CI 13988) carries a partially dominant gene designated Rht_6. The spontaneous recessive gene rht_6 present in the 'short standard' cultivar Burt (CI 12696) was designated to clarify the genetics of height control in the Burt background relative to a taller form (Itana). Gene Rht_7 has been designated from studies by others. The relation of rht_4, Rht_6, rht_6 and Rht_7 is yet unknown. Our recent research indicates that a single partially dominant reduced height gene in mutant Magnif 41 M 1 (CI 17689), and the possibly completely dominant reduced height gene present in mutant Karcag 522 M 7K merit early identification in the wheat genome because of their promise for breeding. These mutant genes represent a significant addition to the previously known germ plasm resources for reduced height in wheats. A coordinated, international effort is needed to expedite genetic analyses, identification and breeding evaluation of the large numbers of reduced height mutants even now available. Cooperative interchange of potentially useful stocks and information about them will stimulate breeders to employ promising induced mutants to complement or supplement spontaneous reduced height gene sources, thus reducing genetic vulnerability of wheat, the world's most important cereal crop.

50020 (IAEA-TECDOC—268, pp 39-41) **Evaluation of semi-dwarf mutants in triticale and wheat breeding programmes.** Driscoll, C.J. (Adelaide Univ., Glen Osmond (Australia). Waite Agricultural Research Inst.). Jul 1982. NTIS (US Sales Only), PC A07/MF A01. (CONF-8103168—).

From Research co-ordination meeting on semi-dwarf cereal mutants and their use in cross-breeding; Vienna, Austria (2 Mar 1981).

A number of short-statured triticale plants were selected in M_4 following gamma-ray or EMS treatment of seed of Beagle and

DR-IRA triticales. Selection for homozygous mutants will be attempted in M_3. The Cornerstone male sterility mutant malc is being combined with the three GA-insensitive, reduced-height mutants Gai/Rht1, Gai/Rht2 and Gai/Rht3 in order to establish a composite cross based on homozygosity of a given Gai/Rht allele. This would allow selection for minor genes for increased height on a GA-insensitive, reduced-height background.

50021 (IAEA-TECDOC—268, pp 43-46) **Semi-dwarf winter wheat breeding in Hungary.** Barabas, Z.; Kertesz, Z. (Cereal Research Inst., Szeged (Hungary)). Jul 1982. NTIS (US Sales Only), PC A07/MF A01. (CONF-8103168—).

From Research co-ordination meeting on semi-dwarf cereal mutants and their use in cross-breeding; Vienna, Austria (2 Mar 1981).

A series of wheat varieties are grown in Hungary with good grain yield but with a relatively long stalk, 95-115 cm. Significance of evolving semi-dwarf versions of these is stressed. Genetic and breeding works for semi-dwarf type and radiation induced mutation studies in wheat in the institute are described. Plans for mutation breeding for semi-dwarfness and genetic characterization of induced as well as non-induced semi-dwarf mutants are outlined.

50022 (IAEA-TECDOC—268, pp 47-51) **Evaluation of three induced short-culm wheat mutants obtained in Brazil.** Veiga, A.A.; Camargo, C.E.; Felicio, J. (Instituto Agronomico de Campinas (Brazil)); Barros, B.C. (Instituto Biologico de Sao Paulo (Brazil)); Tulmann Neto, A.; Menten, J.O.M.; Ando, A. (Centro de Energia Nuclear na Agricultura, Piracicaba (Brazil)). Jul 1982. NTIS (US Sales Only), PC A07/MF A01. (CONF-8103168—).

From Research co-ordination meeting on semi-dwarf cereal mutants and their use in cross-breeding; Vienna, Austria (2 Mar 1981).

In 1974 a wheat mutation breeding research was initiated to select semi-dwarf mutants. The variety utilized was IAC-5 which is not so demanding as far as soil fertility is concerned and shows a certain resistance to high soil Al content. However its high culm length might cause yield losses due to lodging. After seed gamma irradiation, three semi-dwarf mutants were selected at the M_2 generation. Since then, these mutants have been tested in several parts of Brazil. The results of the trials showed that on average the mutants yielded less than the original variety, and possible reasons for the reduced yield are discussed.

50023 (IAEA-TECDOC—268, pp 53-64) **Short-straw mutants and other dwarfing gene sources used for the improvement of wheats and barley in Italy.** Giorgi, B.; Mosconi, C. (Comitato Nazionale per l'Energia Nucleare, Casaccia (Italy). Centro di Studi Nucleari). Jul 1982. NTIS (US Sales Only), PC A07/MF A01. (CONF-8103168—).

From Research co-ordination meeting on semi-dwarf cereal mutants and their use in cross-breeding; Vienna, Austria (2 Mar 1981).

The reduction of plant height in wheat and barley by cross-breeding in Italy started at the beginning of this century. In common wheat, the semi-dwarf character can be traced back to a Japanese variety Akakomugi used as a parent in cross-breeding. In durum wheat, semi-dwarf varieties have been developed by the introduction of the Norin 10 gene Rht_1. Barley is the only cereal crop in which plant height and lodging resistance have still to be improved. Short-straw mutants have been induced by radiation treatments at Casaccia Nuclear Center in all the cereals mentioned above. In bread wheat, demand for short-straw types being less imperative, use of induced mutants has been rather limited. About 40 short-straw mutants have been induced in the variety Strampelli. Among them, two mutant lines, St 116 and St 121, have proved to be more resistant to lodging and equal to or higher in yield potential than the mother variety. In durum wheat, 4 mutants have been released as varieties and 4 other mutants have been used in cross-breeding and yielded semi-dwarf varieties. These varieties are competitive with other semi-dwarf varieties of different origins and represent valid alternatives to the "mono-culture" of Norin 10 types. In barley, a short-straw mutant (Risoe 9265) has been crossed with some tall Italian varieties and promising progenies are being selected.

50024 (IAEA-TECDOC—268, pp 65-72) **Useful mutations induced in durum wheat by gametophyte and seed treatments.** Filev, K.A. (Bylgarska Akademiya na Naukite, Sofia. Inst. po Genetika); Donini, B. (Joint FAO/IAEA Div. of Isotope and Radiation Applications of Atomic Energy for Food and Agricultural Development, Vienna (Austria)). Jul 1982. NTIS (US Sales Only), PC A07/MF A01. (CONF-8103168—).

From Research co-ordination meeting on semi-dwarf cereal mutants and their use in cross-breeding; Vienna, Austria (2 Mar 1981).

The durum wheat breeding programme aims at improving the local cold tolerant varieties for lodging resistance, higher yield and good grain quality. The Bulgarian durum wheat cv. 233 has been submitted to mutagenic treatment of gametophytes (1,2,3,4 krad, ^{60}Co γ-rays), seeds (10 krad, ^{60}Co γ-rays; 1 krad, fast neutrons; EMS, 1.5% for 20 hrs at 20 deg. and both gametophytes and seeds (2 krad + 10 krad, γ-rays); 2 krad γ-rays + 1 krad, fast neutron; 2 krad, γ-rays + EMS, 1.5%). 2264 M_1 plants were harvested and in each plant the spike of the main culm was kept separate from those produced on the later tillers. A higher frequency M_1 plant progenies segregating for morphological and semi-dwarf mutations was observed after gametophyte and combined gametophyte and seed irradiation as compared to only seed treatment. Furthermore, after gametophyte irradiation, out of the 131 M_1 segregating progenies, 122 were homogenously heterozygous for the induced mutations (non-chimeric) and all the spikes of a plant were carrying the same mutation. Only a very small number were semi-dwarf mutations and they were obtained only after gametophyte irradiation. The induced semi-dwarf mutants are under evaluation for lodging resistance, yield and protein content. They will be used also in the cross-breeding programme.

50025 (IAEA-TECDOC—268, pp 85-104) **Semi-dwarf rice mutants and their agronomic evaluation.** Narahari, P.; Joshua, D.C.; Rao, N.S. (Bhabha Atomic Research Centre, Bombay (India). Biology and Agriculture Div.). Jul 1982. NTIS (US Sales Only), PC A07/MF A01. (CONF-8103168—).

From Research co-ordination meeting on semi-dwarf cereal mutants and their use in cross-breeding; Vienna, Austria (2 Mar 1981).

Experiences with induced semi-dwarf rice mutants, isolated at Bhabha Atomic Research Centre and also at some other institutions in India are briefly reviewed. In most of the cases, the dwarfing gene in the induced mutants is found to be allelic to Dee-geo-Woo-gen gene but a few instances of non-allelism are also reported. Use of induced mutants in hybridization experiments, on a limited scale, have indicated promising results. Several hybrid derivatives that combine the desirable traits of semi-dwarf stature, long slender quality grain, translucent kernel with high yields and/or moderate resistance to stress conditions have been developed. They showed yield potentials between 4 and 8 t/ha at different locations in the country and were in general statistically on a par and often superior to even the course grained checks IR-8 and Jaya. A better understanding of the already available rice genetic stocks of semi-dwarf stature and such induced mutants, with respect to their morphology, cytology, physiology, agronomy and genetics, will help in identifying new and better sources of dwarfing genes.

50026 (IAEA-TECDOC—268, pp 119-126) **Semi-dwarf rice breeding in Japan and genetic study of semi-dwarf rice mutants.** Yamagata, H.; Tanisaka, T.; Yonezawa, K.; Fujimoto, M. (Kyoto Univ. (Japan). Faculty of Agriculture). Jul 1982. NTIS (US Sales Only), PC A07/MF A01. (CONF-8103168—).

From Research co-ordination meeting on semi-dwarf cereal mutants and their use in cross-breeding; Vienna, Austria (2 Mar 1981).

In the 15 years from 1958 to 1973, average culm length of Japanese rice varieties showed a rapid reduction from 95 cm to 82 cm, realistically reflecting the postwar breeding trend in Japan with use of radiation induced mutants. Nowadays, it can be said that the improvement of rice towards short culm length has almost reached the goal and the coming objective of breeding will mainly be directed in creating further stiffer-culm varieties with the present

culm length. However, some problems remain to be solved. Firstly, the source of semi-dwarf genes are traced back to only a few stocks. Secondly, genetical studies on semi-dwarfness still remain quite undeveloped, although they are considered to be indispensable for enhancing the efficiency of rice breeding. Results of some genetic studies of radiation induced semi-dwarf mutants are presented. Future research plans presented stress identifying and evaluating the useful semi-dwarfing genes in our mutant stocks as cross breeding parents, to contribute to averting the potential risk of genetic vulnerability of semi-dwarf rice.

50027 **(INIS-mf—7781(Vol.3)) Summaries from 17. week of the Balcan Medical Union, 29 Aug - 3 Sep 1982.** (Balcan Medical Union, Sofia (Bulgaria)). Sep 1982. 191p. (CONF-8208125—Vol.3-Summ.). NTIS (US Sales Only), PC A09/MF A01. Order Number DE83780943.

From 17. symposium of the Balcan Medical Union; Sofia, Bulgaria (29 Aug 1982).

Individual papers are included in the data base.

50028 **(INIS-mf—8030) Order of 24 April 1970 on the setting up of ionizing radiation electric generators for medical purposes.** 29 May 1970. 1p. (In French). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780785.

Published in the French Official Gazette.

This Order prescribes that the setting up of electric generators emitting ionizing radiations with an energy higher than 500 KeV used for medical purposes are subject to licensing and provides a model applications form to this effect. (NEA).

50029 **(INIS-mf—8087) Investigations of the tracheobronchial epithelium of rat after X-ray irradiation and inhalation of ^{212}Pb aerosol.** Petri, P. (Giessen Univ. (Germany, F.R.). Fachbereich Humanmedizin). 1981. 82p. (In German). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702765.

Thesis.

Early reactions of the tracheobronchial epithelium of rats. Be up to 96 h after irradiation have been investigated. Detection of autoradiographically labelled DNA in the basal cells is a measure of the regenerative function of the epithelium. The labelling index is determined on the basis of histological preparations of trachea and bronchi. Each group of animals was exposed to partial irradiation of the thorax of 500 R, 1000 R and 1500 R. A dose-dependent reduction of the labelling index is found with a minimum after 24 h. A further group of animals inhaled ^{212}Pb aerosol while the control group was given inactive aerosol. The calculations of Hofmann (1969) yield a value of about 170 rad for the trachea and 480 rad for the upper part of the lungs. The labelling index after 12 h is lower than in the animals exposed to 500 R. It is significantly higher in the lobar bronchi. At the time of sacrificing, the labelling index is higher in all regions than the labelling index of 500 R animals. This labelling method enables quantitative determination of DNA synthesis and labelling index after radiation exposure. The study did not indicate the stage of development in which the so-called "replacement cells" of the bronchial epithelium are influenced by radiation exposure. Radionuclide inhalation does not affect the bronchial DNA synthesis index as strongly as assumed on the basis of dose estimates. Ater 12 h, the trachea shows a stronger reaction than the bronchi. Explanations are offered. (orig./MG).

50030 **(INIS-mf—8100) Radiation protection standards.** Koelzer, W. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 21p. (CONF-8009308—3). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702785.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

The present paper deals with: Objectives and basic concepts of radiation protection, basic radiobiological considerations, the ICRP system of dose limitation and with operational radiation protection (limits, reference levels, occupational exposure). (RW).

50031 **(INIS-mf—8128) Molecular mechanisms induced by the effects of ionizing radiation on nucleic acids: Free radicals in 5-halogenated uracil derivatives after reaction of radiolysis products of water in low-temperature glass.** Riederer, H. (Regensburg Univ. (Germany, F.R.). Naturwissenschaftliche Fakultaet 3 - Biologie und Vorklinische Medizin). 1981. 234p. (In German). NTIS (US Sales Only), PC A11/MF A01. Order Number DE83702763.

Thesis.

This thesis deals with the molecular mechanisms induced by the effects of ionizing radiation on the DNA. The study has been made for the main purpose of clarifying the possible role of the indirect effect, namely the attack of diffusible water radicals, in the process of radiosensitivity enhancement due to the incorporation of bromouracil instead of thymine into the DNA. The results of the experiments can be summarized by the statement that among the reactions studied in the low-temperature glasses, none revealed such a clear difference between uracil and thymine on the one hand, and the halogenated uracils on the other, that this difference could suffice to explain in terms of quality and quantity the observed in-vivo enhancement of radiosensitivity by halogenated uracils. This conclusion is in agreement with the results of radiobiological measurements on phagae and bacteria which in all cases revealed no or only very slight enhancement of the radiosensitivity in the indirect effect subsequent to bromouracil incorporation. (orig./AJ).

50032 **(INIS-mf—8140) Operational radiation protection and monitoring programme.** Schroeder, H.J. (Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik). 1980. 20p. (CONF-8009308—34). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702786.

From IAEA interregional training course on safety analysis; Karlsruhe, F.R. Germany (3 Sep 1980).

All the tasks of the Radiation Protection Department at the Nuclear Power Plant are mentioned and described. These tasks determine the necessary manpower and qualification of the personnel. Certain organizational structures are required to guarantee the effective work of this department. The Radiation Protection Department of the Biblis Nuclear Power Station and its tasks, manpower, organization etc. serves to illustrate the material covered by this lecture. (orig./RW).

50033 **(INIS-mf—8147) Study of the reactivation of X-ray inactivated lambda bacteriophages by irradiated Escherichia coli bacteria.** Kiessling, W. (Muenchen Univ. (Germany, F.R.). Fakultaet fuer Medizin). 6 Nov 1980. 28p. (In German). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702764.

Thesis.

Bacteriophages lambda and E.coli cells were exposed to X-rays in LB medium. Host cells exposed to a dose of 85 to 765 Gy had a reactivation factor 1.3 to 3.0 for bacteriophages inactivated by X-rays. The capacity of the bacteria for bacteriophage mutliplication remained apparently unchanged in this dose range. After UV-irradiation of the host cells, only a reactivation factor of 1.3 was found for bacteriophages exposed to X-radiation. The comparatively low Weigle reactivation of bacteriophages exposed to X-radiation - as compared with bacteriophages exposed to UV radiation was analyzed by counting free, non-adsorbed bacteriophages determined by filtration of radioactively labelled bacteriophage-host complexes, it was found to be due to a reduced adsorptivity. Reactivation experiments with bacteriophages exposed to X-rays and host bacterias with different degrees of radiosensitivity proved this assumption to be correct.

50034 **(ORNL/TM—8824) Assessing the risks from exposure to radon in dwellings.** Walsh, P.J.; Lowder, W.M. (Oak Ridge National Lab., TN (USA)). Jul 1983. Contract W-7405-ENG-26. 40p. NTIS, PC A03/MF A01. Order Number DE83016347.

The factors used to assess the radiation dose and health risks from human exposure to radon in dwellings are critically reviewed in this summary. Sources of indoor radon and determinants of air concentrations and exposure levels are given as well as the uncertainties that exist in their formulation. Methods of assessing health

effects from inhalation of radon and its progeny are discussed with emphasis on dosimetry of radon daughters and formulation of risk per dose values. Finally, methods of assessing risks for general population exposures to indoor radon concentrations are treated.

50035 (ORNL/TM—8832) Estimation of health risks from radiation exposures. Randolph, M.L. (Oak Ridge National Lab., TN (USA)). Aug 1983. Contract W-7405-ENG-26. 22p. NTIS, PC A02/MF A01. Order Number DE83016457.

An informal presentation is given of the cancer and genetic risks from exposures to ionizing radiations. The risks from plausible radiation exposures are shown to be comparable to other commonly encountered risks.

50036 (PB—83-175695) Role of the U.S. Public Health Service in radiological health: 1946-1969. Terrill, J.G.; DeVore, R. (National Center for Devices and Radiological Health, Rockville, MD (USA)). Sep 1982. 302p. NTIS, PC A14/MF A01.

This report is a history of events involving radiological health activities of the U.S. Public Health Service from 1946 to 1969. It is organized chronologically and by activity. Records from the author's files, the Bureau library, Congressional records, and records of the Joint Committee on Atomic Energy were all used in compiling the history. It includes information on exposure from weapons testing and nuclear accidents. Further it attempts to illustrate how the public health protection methods used by the Bureau of Radiological Health in the 1970's were effective in getting the radiation protection job accomplished.

50037 (PINSTECH/HP—21) Determination of internal contamination of uranium by urine analysis. Afzal, M.; Aziz, A. (Pakistan Inst. of Nuclear Science and Technology, Rawalpindi. Health Physics Div.). 1979. 11p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702315.

The report describes the importance of urine analysis for the determination of internal contamination of a worker for uranium and outlines the objective and scope of the urine analysis. It also discusses briefly the metabolism of uranium in order to establish an empirical relationship between its excretion and body burden. The report finally discusses the results of uranium bioassay studies for radiation workers in the Nuclear Materials Division, PINSTECH.

50038 (PNL-SA—11419) Concepts of dose to soft tissue at the cellular level. Fisher, D.R. (Pacific Northwest Lab., Richland, WA (USA)). May 1983. Contract AC06-76RL01830. 24p. (CONF-830665—3). NTIS, PC A02/MF A01. Order Number DE83013830.

From Health Physics Society summmer school on internal radiation dosimetry; Catonsville, MD, USA (12 Jun 1983).

Radiation effects begin at the cellular level of biological organization. Radiation dosimetry at the cellular level is particularly important for internally deposited alpha and beta particle emitters. Microdosimetry is a mechanism for studying the dose imparted to microscopic sites, for determining hit probabilities, and for determining the probability that sites are missed. Internal microdosimetry calculations are complex, but can be easily executed using computer programs. The investigator must specify the target and its size, determine the radionuclide activity per unit mass for each region in which targets are located, describe the activity per radioactive particulate, understand the geometrical relationship between the activity and the targets, and account for the biological retention of the activity in the region as a function of time. Internal microdosimetry has many potential applications in radiological protection. Microdosimetry is a special research area designed to provide a better understanding of the importance of microscopic patterns of radiation interaction with cells within the broader framework of biochemistry and radiation biology. Its objective is to provide a methodology that is both consistent and precise for correlating biological response to varying levels and distributions of internal emitters. Microdosimetry may contribute to a more complete understanding of the mechanisms of cancer induction by radiation. The correlation between specific energy density and various biological effects might best be treated statistically, since the effects occur in response of stochastic processes. If applied correctly, these concepts should provide a reliable tool for learning more about the effects of radiation and for setting radiation protection standards.

50039 (SKBF-KBS-TR—82-14) Oral intake of radionuclides in the population. A review of biological factors of relevance for assessment of absorbed dose at long term waste storage. Johansson, L. (Svensk Kaernbraenslefoersoerjning AB, Stockholm). Oct 1982. 63p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702314.

Dose factors of some radionuclides have been reviewed with respect to a chronic oral intake by means of the public. The radionuclides taken into account are Pu-239, Np-237, Ra-226, Th-230, Pa-231, Tc-99 and I-129, all of which might be of potential hazard at a long term storage disposal. The parameter that has the major influence on the dose factor, for most of the radionuclides studied, is the uptake from the gut. In order to assess the dose factor it is therefore essential to make a good estimate of the gastrointestinal uptake of the radionuclides under the actual conditions. The 'annual limit of intake' (ALI) given in ICRP 30, is intended to be applicable on a population of workers, and for a single intake. Since the gut uptake in the ICRP-publication are based mainly on uptake values recieved in experimental animals, given single relatively large oral doses of the isotope studied. From a review of current literature, gut absorbtion factors and dose factors, to be used for members of the public at a chronic oral intake, are suggested. Compared with those for workers in ICRP 30, the dose factors increase for plutonium and protactinium, and decrease for neptunium. An attempt to predict possible future changes of the ALI for members of the general public is also made.

50040 Biological effects of neutron radiation produced by Czechoslovak sources of neutrons. Uhlik, J. (Vysoka Skola Zemedelska, Prague (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

Specific characteristics are presented distinguishing the biological effects of neutron radiation from those of other mutagens. Estimated biological effects are also discussed of neutron radiation produced by Czechoslovak sources. As for the induction of mutants with potential breedings applicability, thermal neutrons can be as active as methyl nitrosourea in spite of the fact that they induce relatively lower proportions of chlorophyll mutants.

50041 Possibilities and prospects of controlled mutagenesis in plants. Hendrychova, J. (Karlova Univ., Prague (Czechoslovakia). Prirodovedecka Fakulta). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

The incidence is described of somatic changes in the flower genotype of hybrids between coloured forms of Salvia splendens used as a model plant. It is expected that these changes resulted from somatic crossing-over. The changes were related to the period of flower morphogenesis. In this context are discussed the general possibilities of controlling the spectrum of induced genetic changes by the regulation of biological factors. The importance of an uneven distribution of open DNA segments within the genome in the course of DNA replication and transcription is discussed as is the possible use of time span in the replication of the whole genome and different situations for tissues differentiation. The possible induction of localized chromosomal breakages is very prospective. In vitro cultivation is recommended.

50042 Comparison of mutagenic effects of ionizing radiations and of altered environmental conditions on wheat. Foltyn, J. (Vyzkumne Ustavy Rostlinne Vyroby, Prague (Czechoslovakia). Ustav Genetiky a Slechteni). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

Acute irradiation (15 kR) of seeds with ^{60}Co showed the highest effect on Italian cultivars of winter wheat. This effect was evaluated in 5th generation mutants. Changed environmental conditions (of central Europe) produced analogical forms of mutants in these cultivars; however, their frequencies were lower. The selection of material used for the production of mutants is very important not only with regard to their health condition but also in relation to some morphological traits. The method of transformation through changed environmental conditions is suitable especially for wheat cultivars originating in other latitudes. As far as the home cultivars are concerned the use of ionizing radiation (or of chemomutagens) is preferred for the production of mutants.

50043 Experimental mutation of disease resistance in wheat. Hanisova, A.; Hanis, M.; Knytl, V.; Cerny, J. (Hlavni Specializovana Slechtitelska Stanice, Stupice (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

In 1968 to 1974, 19 cultivars and lines of wheat were treated with mutagens (i.e., with X rays, gamma radiation, neutrons, EMS). ALtogether 140 lines were obtained showing better resistance and/or tolerance to black stem rust, yellow rust, stem rust of wheat, powdery mildew of cereals, and root-rot of wheat. The frequency of the induced mutations was sufficiently high, i.e., 0.0012 to 0.078 mutants per 100 plants of M_3. The major part of mutant lines showed a lower agronomical value due to negative pleiotropy of mutant genes and a changed genetic background of mutants. Some mutant lines can be used as the starting material in hybridization programmes.

50044 Gamma and X irradiation effects on variability and correlations between some quantitative traits of winter wheat in M_3 generation. Petrovic, J. (Vysoka Skola Polnohospodarska, Nitra (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Slovak)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

The variability and correlations of 7 quantitative traits are analyzed using winter wheat species Kosutska (Triticum aestivum var. erythrospermum/koern./Mansf). The following single doses of gamma and X radiation were used in M_0: D_1 1.935 $C.kg^{-1}$; D_2 2.58 $C.kg^{-1}$; D_3 3.225 $C.kg^{-1}$; D_4 3.870 $C.kg^{-1}$; D_5 4.515 $C.kg^{-1}$; D_6 5.160 $C.kg^{-1}$. The weight of grain and the length of ears showed the highest variability (D_1 - gamma irradiation). The lowest variability of the tra+ts under study was found in D_6 after the application of both types of irradiation. All correlation coefficients were significant in the controls. Lower correlations were found after lower doses of radiation while higher ones were observed after higher doses. After X rays a higher frequency of lower correlations was found.

50045 Variability in protein content of wheat grains after irradiation and EMS application. Cerny, J. (Vyzkumny a Slechtitelsky Ustav Obilnarsky, Kromeriz (Czechoslovakia)); Kubanek, J. (Hlavni Specializovana Slechtitelska Stanice, Stupice (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

Mutagenic treatment of winter wheat line ST 813-75 with 12 kR and 0.2.% aqueous solution of EMS induced sufficient variability in the protein content of grains (h^2 0.16 and 0.14) in the M_3 generation allowing selection for a higher protein content. In M_3 the selection was made with the intensity of 2% for protein content of grains and with regard to the preservation of the absolute weight (mass of 1000 seeds). The efficacy of irradiation, evaluated according to the genetic gain in M_3 against controls and according to the significance of differences between the protein content of grains in controls and affected M_2 and M_3 generations, was higher than that of EMS.

50046 Use of nitrate reductase and leaf proteases in assessing wheat (Triticum vulgare) genotypes during vegetation. Kubanek, J. (Hlavni Specializovana Slechtitelska Stanice, Stupice (Czechoslovakia)); Cerny, J. (Vyzkumny a Slechtitelsky Ustav Obilnarsky, Kromeriz (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

The maximum activity of nitrate reductase (NR) of the genotypes under study was found in the period from the end of flowering to the milk ripeness of grains. NR activity estimated in this period showed to be a sufficiently reliable index of protein content in grains. The method of Croy and Hageman was tested with regard to the estimation of activity of leaf proteases in growing plants. There were significant differences in the activity of leaf proteases at individual growth stages. The maximum activity of leaf proteases was observed in the stage of milk ripeness of grains. The line ST-24-75 with a low content of protein in grains differed significantly from genotypes with a higher content of protein in grains; its activity of leaf proteases was lower at the end of flowering and in the stage of milk ripeness.

50047 Use of gliadin electrophoresis for wheat mutant characterization. Sasek, A. (Vyzkumne Ustavy Rostlinne Vyroby, Prague (Czechoslovakia). Ustav Genetiky a Slechteni); Cerny, J. (Vyzkumny a Slechtitelsky Ustav Obilnarsky, Kromeriz (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

A brief survey is presented of results obtained in several research studies of scientists from the Research Institute of Plant Production in Ruzyne and from the Breeding Station in Stupice in the field of verification and characterization of wheat mutants using detailed studies on protein complexes. Electrophoresis was used for the estimation of spectra of proteins of the albumin-globulin and gliadin characters and of anodal isoperoxidases. The proportions of basic protein fractions and of amino acids were also estimated. Attention was paid to the possible use of gliadin spectra evaluated by means of indexes of identity and/or blocs of gliadin components.

50048 **Use of mutations in breeding short-stemmed forms of spring barley with high productivity ears.** Zenisceva, L. (Vyzkumny a Slechtitelsky Ustav Obilnarsky, Kromeriz (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

Numerous studies of the world collection of spring barley revealed a correlation between the height of plant and the length and magnitude of the root system, tillering capacity and ear productivity. Use of dwarf forms of the type "uzu" and of some X ray induced mutants obtained from long-stemmed cultivars did not give expected results. Semi-dwarf and dwarf mutants obtained after treating the seeds of short-stemmed highly productive lines of the Diamant type with different chemomutagens (MNU, MES, etc.) were crossed with the aim to remove the said unfavourable correlations. Using complex hybridization of the productive lines selected with chemomutant MB_2, a semi-dwarf line KM 1952 was obtained by the Cereal Research Institute in Kromeriz showing both a marked tillering capacity and a high productivite of ears.

50049 **Use of gamma radiation mutations in obtaining initial forms suitable for oats breeding.** Velikovsky, V. (Vyzkumny a Slechtitelsky Ustav Obilnarsky, Kromeriz (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

Dry seeds of oats, cv. Diadem, Permit, Tiger, Diane, Pollux, Selma, Ponta and Leanda were irradiated with ^{60}Co in doses of 15, 20, 25 and 40 kR. Starting from the M_2 generation, mutant forms were selected with regard to short-stemness, resistance against lodging and diseases, and grain yields. In 1971 to 1979 altogether 10 breeding strains were obtained from 236,530 irradiated seeds and 88,620 plants which showed a higher level of some economic features than the original cultivars. The major part of these strains was introduced in breeding practice for further selection.

50050 **Use of some mutagens in obtaining initial forms suitable for winter rye breeding.** Machan, F. (Vyzkumny a Slechtitelsky Ustav Obilnarsky, Kromeriz (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

Cultivars Esto, Kustro, HGP 20, Fenix, Animo, Hellkorn II were irradiated with acute doses of gamma radiation (10 and 15 kR). Under field conditions they showed to be little effective. Doses of 15 and 20 kR were more effective and the latter induced a short-stemmed yielding strain in cv. Hellkorn II. Cultivars Dankovake nove and Halo were irradiated with 20 and 25 kR. An early selection of short-stemmed mutants was practiced according to the lengt of coleoptile. The dose of 20 to 22 kR is suitable for the induction of mutants. Mutations are also affected by sensitivity of individual cultivars, the colour of grains and water content in grains.

50051 **Effects of chronic gamma irradiation and inbreeding on manifestations of some quantitative traits in G_3I_1 generation of winter rye.** Votava, V. (Vyzkumny a Slechtitelsky Ustav Picninarsky Troubsko u Brna, Slechtitelska Stanice Vetrov (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

The effects of 3 doses of radiation upon the manifestation and extension of phenotypic variability in some quantitative traits (4 experimental treatments A to D) were estimated in the G_3I_1 generation after chronic irradiation with ^{60}Co and inbreeding in the G_2 generation. Treatment A involved doses of 0.8927 to 0.6966 $C.kg^{-1}$, treatment B 0.3354 to 0.3011 $C.kg^{-1}$, treatment C 0.1014 to 0.0916 $C.kg^{-1}$ and treatment D no irradiation (controls). The efficiency of the doses was evaluated according to the height of plants, the weight of 1000 grains, the number of grains per ear, and gross protein content in grains. An increase in the phenotypic variability was demonstrated in the major part of traits under study. Statistically significant differences between individual treatments were found.

50052 **Use of ionizing radiation in grass breeding. I. Festuca rubra L.** Indruch, I.; Svetlik, V.; Ligocki, J. (Vyzkumny a Slechtitelsky Ustav Picninarsky Troubsko, Slechtitelska Stanice Fulnek - Hladke Zivotice (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

Two subspecies of F. rubra occurring in natural localities of north-east Moravia (CSSR) in the Beskydy Mts. were used. In Festuca rubra L. ssp. genuina grandiflora (Hack.) $2n=8x=56$, F. rubra represented a model species used for testing the effects of both acute and chronic gamma irradiation. In Festuca rubra L. ssp. vulgaris (Gaud.) Hay $2n=6x=42$, new breeding was realized with success. The effects on important features of grasses were identical in both cases. The extension of combining abilities is especially important because it allows the production of forms less frequent in natural populations.

50053 **Use of ionizing radiation in grass breeding. II. Poa pratensis L.** Svetlik, V.; Indruch, I.; Fojtik, A.; Bajer, K. (Vyzkumny a Slechtitelsky Ustav Picninarsky Troubsko, Slechtitelska Stanice Fulnek - Hladke Zivotice (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

Ionizing radiation induced sexuality in this apomictic grass. Sexual strains were isolated and selected individuals were crossed. Polycross and recurrent single cross methods allowed restoring apomixis. The resulting apomictic strains showed excellent traits and transgressed hereditary potentials of parental components. The method is described of breeding and the productivity of individual breeding techniques is discussed. It is shown that the number of strains should be reduced and the most productive strains should be used for the formation of synthetic cultivars.

50054 **Use of chronic irradiation in formation of new rape genotypes.** Fabry, A.; Zukalova, H. (Vysoka Skola Zemedelska, Prague (Czechoslovakia)); Cerny, J. (Hlavni Specializovana Slechtitelska Stanice, Stupice (Czechoslovakia)); Folk, A. (Vyzkumny a Slechtitelsky Ustav Technickych Plodin a Luskovin Sumperk, Slechtitelska Stanice Slapy u Tabora (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

Chronic irradiation of hybrid plants of F_1 generation obtained by crossing the Canadian rape without erucic acid with Ea-

ropean winter varieties containg this acid, doubled the frequency of winter genotypes and increased significantly the frequency of required recombinations of winter character and absence of erucic acid in F_2-M_2. Genotypes with a more favourable ratio between linoleic and linolenic acids were obtained in the irradiated F_2-M_2 population. The obtained radio-induced mutants are used for the production of new varieties of winter rape without erucic acid at the Slapy Breeding Station.

50055 **Radiation mutagenesis in Faba vulgaris breeding programme.** Vlk, J. (Vysoka Skola Zemedelska, Prague (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

In experiments with 4 varieties of F. vulgaris different methods of gamma irradiation were used, in some cases also in combination with EMS. The effect of EMS combined with chronic gamma irradiation showed varietal differences in the sensitivity of the species. The maximum value of chlorophyll mutations was 25 per cent (after doses of 0.193 $C.kg^{-1}$). The cultivar Povazsky showed hggher sensitivity. The cultivar Lohmanns Weender showed a two-peak curve after irradiation with doses ranging from 0.129 to 2.322 $C.kg^{-1}$. The first peak occurred at 0.258 $C.kg^{-1}$ after 12 hours of irradiation, the second at 1.87 $C.kg^{-1}$ after 24 hours. In the cv. Inovec a white-flower type and a topless type were found. They were obtained after the application of 0.124 to 0.409 $C.kg^{-1}$. The topless type was rather unstable.

50056 **Use of gamma radiation in breeding Faba vulgaris Moench, var. minor Beck.** Hudec, J. (Slachtitelska Stanica Viglas - Pstrusa (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

An induced (from M_3 to M_6) population was studied using repeated selections with the aim of detecting strains with small-sized seeds and a good niveau of economic traits. It was found that acute irradiation of seeds with a dose of 6 kR markedly increased the variability of economic traits. The length of vegetation period increased by 10 days, the traits of green plants by 11 per cent, those of ripe plants by 9 per cent and the gross content of protein in dry matter of hay by 7 per cent. The increased variability of economic traits allowed the selection of 10 strains with small-sized seeds; strains 44, 58 and 59 also showed a good level of all other economic traits under study. It can be concluded that the positive correlation between the size of seeds and productivity was significantly disturbed. This finding is very important because the correlation is very strong and it is very difficult to disturb it by sexual hybridization.

50057 **Use of gamma field in increasing variability in Faba vulgaris Moench. population.** Pippalova, E. (Vyzkumny a Slechtitelsky Ustav Technickych Plodin a Luskovin Sumperk - Temenice, Pracoviste Uhersky Ostroh (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

The results are presented of studies on the possible extension of variability of some yield and breeding traits of a population of Faba vulgaris after chronic irradiation in a gamma field. The experiments demonstrated the effect of chronic gamma irradiation (in doses below 2210 R) on vegetation. Higher doses were lethal for Faba vulgaris. In M_2 a lower germinating capacity, a higher branching and a reduced height of plant were found after doses over 1 kR. In M_3, higher variability of some traits (height of insertion of the first pod, number of fertile nodes, number of pods and number of seeds) was found in the irradiated populations regardless of the radiation dose.

50058 **Mutagenic effect of X radiation on soya: optimization of doses for field conditions according to M_1 and M_2 generations.** Vagera, J. (Ceskoslovenska Akademie Ved, Olomouc. Ustav Experimentalni Botaniky:. pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

Seeds of cultivated soya (cv. Adepta, American Yellow, Kamanety, Merit) were subjected to different doses of X rays. In M_1, increasing the doses was associated with a marked reduction in the average number of seeds per plant. The number of pods per plant was less reduced and the average height of plant was least affected. It was found that the optimum dose of radiation inducing sufficient frequency of mutations together with sufficient survival under field conditions ranged from 15 to 20 kR.

50059 **Obtaining cherry and apple tree radiomutants by irradiation of grafts in gamma cell.** Chvojka, L.; Fridrich, A. (Ceskoslovenska Akademie Ved, Prague. Ustav Experimentalni Botaniky:. pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

The aim of the study was to obtain dwarf mutants of cherry and apple trees. Two methods of irradiation were used: a) winter grafts were irradiated with ^{60}Co (4-5 kR) and grafted in the crowns of adult trees or of two-year-old rootstocks; b) summer buds on mature annual shots were irradiated with 2-3 kR and grafted on two-year-old rootstocks. Thus the clones of dwarf cherry trees (cv. Napoleon's and Techlovicka) were obtained which were further tested for fruit-bearing in experimental plantations. Colour mutants of apple tree (cv. Champion) with yellow and red fruits were also obtained as well as dwarf types of trees.

50060 **Induction of somatic mutations in strawberries by ionizing radiation.** Simanek, J.; Caganova, I. (Vyskumny Ustav Ovocnych a Okrasnych Drevin, Bojnice (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Slovak)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

The possibilities were studied of inducing mutations by ionizing radiation (acute doses from 2 to 15 kR). After doses of 6 kR and more the variability of major vegetative traits increased. The frequency of mutations increased with increasing doses of radiation. The obtained results suggest that it is possible to induce somatic mutations in strawberries, especially with regard to breeding of new cultivars with parameters allowing mechanized harvest, with better technological properties and with increased resistance to pests.

50061 **Application of ionizing radiation in hop breeding.** Beranek, F. (Vyzkumny Ustav Chmelarsky, Zatec (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

Chronic (in a gamma field) and acute irradiation was used for preserving the quality of Czech hop (Humulus lupulus L.). In the gamma field the best results were obtained after vegetation doses of 3200 to 1800 roentgens. When irradiating dry seeds the optimum dose was 800 to 1000 rads. In M_1 to M_4 very variable material was obtained which could be used for further breeding. Line Sm 70/2621 was included in state-controlled variety trials because of its productivity (i.e., 2.5 tons per hectar) and contents of alpha bitter acids (i.e., 8.90 per cent).

50062 **Induction of somatic mutations in roses.** Benetka, V. (Vyzkumny a Slechitelsky Ustav Okrasneho Zahradnictvi, Pruhonice (Czechoslovakia)). pp 196 of Application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology. Proceedings of national seminar. Brno, Czechoslovakia; Vysoka Skola Zemedelska (1980). (In Czech)(CONF-8010329—).

From Conference on application of nuclear methods and ionizing radiation in plant genetics, breeding and physiology; Brno, Czechoslovakia (7 Oct 1980).

In two varieties of roses (Alexander and Sonia) gamma radiation was applied in doses of 2, 3, 4, 5, and 6 kR (the dose rate either 830 or 750 R per min.) to induce somatic mutations. Grafts with one bud were rooted after irradiation and further cultivated in a glasshouse. V_3 shoots were further propagated after double cutting. In the Alexander variety, both chimeric (stripping) and non-chimeric changes in flower colour were observed in 5 and 1 progenies, respectively. The change in flower colour was observed in one case.

5602 Thermal Effects

REFER ALSO TO CITATION(S) 49942, 49943, 50015

50063 (IAEA-TECDOC—266, pp 143-156) **Hyperthermia as a radiosensitizing and cytotoxic agent. Cell biological and biochemical considerations.** Streffer, C.; Van Beuningen, D. (Institut fuer Medizinische Strahlenphysik und Strahlenbiologie, Universitaetsklinikum Essen (Germany, F.R.)). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

A thermal treatment of mammalian cells has a strong potential on cell killing. It can act as a cytotoxic agent by itself. Cells which are rather radioresistant, like S-phase cells or hypoxic cells in an acidic environment, are very thermosensitive. These biological differences may be an advantage for tumour therapy. Hyperthermia induces in cells and tissues strong alterations in physiological and biochemical parameters which may influence the cytotoxic potential. The breakdown of blood microcirculation can lead to a further elevation of temperature, as heat transport is interrupted from the exposed tissue. In combination with ionizing radiation hyperthermia enhances radiation effects in a potentiating manner. The recovery and repair processes are reduced. Besides the shoulder also the D_0 of the dose-effect-curve becomes smaller. Such effects are mainly described for low LET radiation. The thermal enhancement ratio (TER) is found to be around 2; it strongly depends on the temperature and the heating time. While for the action of hyperthermia alone damage to the cellular membranes is important, the radiosensitization is apparently caused by enhancement of chromosomal damage. The latter effect is observed with lower temperatures than the first one. For the clinical use of hyperthermia with ionizing radiation the sequence and interval of the two agents are important. The TER is optimal after a simultaneous treatment in normal tissues as well as in tumours. An interval of some hours between radiation and hyperthermia may be advantageous in order to improve cancer therapy. Fractionated heating with low temperatures induces thermotolerance when hyperthermia is applied alone. For the radiosensitizing effect thermotolerance is apparently less important. These phenomena are relevant for the clinical use.

50064 (IAEA-TECDOC—267, pp 49-61) **Heat-induced mineral imbalances in animals.** Kamal, T.H. (Atomic Energy Establishment, Cairo (Egypt)). Sep 1982. NTIS (US Sales Only), PC A09/MF A01. (CONF-8010327—).

From Research co-ordination meeting on the use of isotope techniques for detection of moderate mineral imbalances in farm animals; Nicosia, Cyprus (6 Oct 1980).

Mineral balance was determined on 14 Friesian heifers maintained in metabolic cages in the climatic laboratory at 19 deg. C for 33 days followed by 11 days at 40 deg. C for 5 hr daily and 19 deg. C for the rest of the day. The data of the last 9 days of mild climate were compared with those of hot climate. The data revealed that in the early days of heat exposure the ash, Ca, Mg and P balance decreased more significantly than in the mild climate - by 17.6%, 24.1%, 65.7% and 11.5%, respectively as a result of the increase in their urinary and fecal excretions. At the end of heat exposure they decreased also more significantly than in mild climate but greater than at early heat exposure. These results are attributed to the destruction of tissues under heat stress with concomittant washing out of minerals by increased water turnover rate. Na and K balances, on the other hand, were not affected by heat stress to maintain the osmotic pressure of body fluids, which increase in heat stress. ^{131}I-whole body turnover rate constant (K) and half life value (Tsub(1/2)) were determined in 9 albino rats maintained at 28 deg. C and in another 9 albino rats maintained at 35 deg. C for 8 days using a whole body counter with NaI detector. The data revealed that in mild climate the K was larger ($P < 0.05$) and the Tsub(1/2) was shorter ($P < 0.05$) than in hot climate. The K values were 8.29×10^{-3} and 6.84×10^{-3}, respectively and Tsub(1/2) values were 84.6 and 103.1 hrs, respectively. These results suggest that iodine allowances for animals should be increased under mild climate than under hot climate.

5603 Chemicals Metabolism And Toxicity

REFER ALSO TO CITATION(S) 48517, 48584, 48584, 49874, 49936, 49937, 49938, 49939, 49940, 50013, 50014

50065 (IAEA-TECDOC—266, pp 41-48) **Prospects for improved hypoxic cell radiation sensitizers.** Adams, G.E.; Sheldon, P.W.; Stratford, I.J. (Institute of Cancer Research, Sutton (UK). Surrey Branch). Oct 1982. NTIS (US Sales Only), PC A11/MF A01. (CONF-8108155—).

From IAEA seminar on prospective methods of radiation therapy in developing countries; Kyoto, Japan (31 Aug 1981).

The neurotoxic properties of misonidazole will substantially limit its clinical applicability: sensitizers with higher therapeutic ratio are therefore required. This paper describes some of the steps that are being taken to achieve this. Therapeutic ratio can be increased by protection against the neurotoxic properties of misonidazole, increase of the sensitizing efficiency of this drug by different scheduling or by replacement of misonidazole by less neurotoxic and/or more efficient sensitizers. A split-dose scheme for the administration of misonidazole is proposed that could, in principle, exploit the fast component of radiosensitization and the additional sensitization that would be achieved by suppression of intracellular SH compounds. Properties of some sensitizers of current experimental or clinical interest are discussed. These include desmethylmisonidazole, less neurotoxic analogues of misonidazole, an unusually active series of nitroimidazoles and electronaffinic sensitizers containing alkylating functions.

50066 (INIS-mf—8148) **Enzyme histochemical and autoradiographic studies of the influence of partial hepatectomy on the induction of liver tumors by diethylnitrosamine (DENA). II. Effect of proliferation stimulation in the late stage of DENA feeding.** Flakowski, W.D. (Muenchen Univ. (Germany, F.R.). Fachbereich Medizin). 7 Dec 1978. 68p. (In German). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702768.

Thesis.

Hepatocellular carcinomas can be induced in rats by feeding 5 mg diethyl nitrosamine per kg and day. The animals will die of cancer after a latency period of 130 to 150 days. During the latency period, histochemical, morphological and proliferation-kinetic alter-

ations can be observed in certain groups of liver cells. These cell populations can be analyzed by enzyme-histochemical and autoradiographic means. The study suggests that a proliferation stimulus in the form of partial hepatectomy at a late stage of Daena cancerogenesis will not influence the growth of liver cell populations with preneoplastic alterations. Also, tumour genesis will not be influenced. (orig./MG).

50067 **(ORNL/PPA—83/4) Assessment of potential health effects of light-duty diesel exhaust.** Travis, C.C.; Munro, N.B. (Oak Ridge National Lab., TN (USA)). Jul 1983. Contract W-7405-ENG-26. 30p. NTIS, PC A03/MF A01. Order Number DE83016393.

The potential human health impacts of a substantial increase in the use of light-duty diesel vehicles for personal transportation (50% of the automobile fleet by the year 2020) were assessed with recommendations for future research. Available data concerning the relationships between diesel emissions, ambient air quality, and human health are summarized. The authors conclude that the estimate for the number of annual lung cancer deaths by the year 2020 as a result of exposure to diesel particulates is between 350 and 2100. Lack of comparable data for gasoline engines makes a comparison of the effects of diesel and gasoline engines difficult. However, available data suggest that the health effects from gasoline engines without catalytic converters and burning leaded fuel may be an order of magnitude greater in a per mile basis than those from diesel engines. On the other hand, the health effects from gasoline engines with catalytic converters and burning unleaded fuel are likely to be an order of magnitude less than the health effects from diesel engines.

50068 **(ORNL/TM—8572) Effects of temperature and nutritional state on the toxicity of acridine to the calanoid copepod, Diaptomus clavipes Schacht.** Cooney, J.D.; Gehrs, C.W.; Bunting, D.L. II. (Oak Ridge National Lab., TN (USA)). Jul 1983. Contract W-7405-ENG-26. 150p. NTIS, PC A07/MF A01. Order Number DE83016461.

Portions are illegible in microfiche products. Original copy available until stock is exhausted; Thesis. Submitted to Univ. of Tennessee, Knoxville.

Acute and chronic bioassays were performed on the calanoid copepod, Diaptomus clavipes, using the azaarene, acridine, as the test compound. Tests were performed at three temperatures (16°, 21°, 26°C) and over a range of nutritional conditions. Survival, growth, development, and reproduction were all affected by exposure to acridine. These effects were modified by temperature and nutritional state of the animals.

50069 **(PB—83-171694) Effects of ozone and sulfur dioxide on alfalfa yields and hay quality. Final report.** Brewer, R.F.; Ashcroft, R. (California Univ., Parlier (USA). San Joaquin Valley Agricultural Research and Extension Center; California State Resources Agency, Sacramento (USA)). Mar 1982. 29p. NTIS, PC A03/MF A01.

Alfalfa (Medicago sativa) is an extremely important crop in California, ranking below number 1 cotton and number 2 grapes in dollar value. An air pollution effects experiment more nearly approximating 'field conditions' was initiated at the University of California San Joaquin Valley Research and Extension Center near Reedley in the spring of 1979. Ambient ozone concentrations reduced Moapa yields approximately 8 to 13% but had no measureable effect on variety WL-512. Exposure to a SO_2 concentration of 10 PPHM for six hours four times per week reduced yields by both varieties approximately 9%.

50070 **(PNL-SA—9942) Heteroatomic PAH: analysis, bioassay, and implications for air quality.** Wilson, B.W. (Pacific Northwest Lab., Richland, WA (USA)). 1981. Contract AC06-76RL01830. 25p. (CONF-8110288—1). NTIS, PC A02/MF A01. Order Number DE83014638.

From OECD workshop on PAH; Pairs, France (19 Oct 1981).

Recent advances in the application of rapid in vitro bioassays to screen complex mixtures for chemical carcinogens have led to the recognition that a wide variety of heteroatomic polyaromatic hydrocarbons associated with fossil fuels or their utilization may act as genotoxins. This paper reviews briefly some of what is known about the genetic activity of heteroatomic PAH, and illustrates how bioassays may be used along with chemical analysis to determine the principle agents responsible for such activity in complex mixtures arising from the processing and utilization of fossil fuels. The separation and analysis of heterocyclic PAH in complex mixtures is reviewed to some extent, as well as what is known about their behavior in various in vitro tests for genotoxicity. Coal liquefaction source materials serve as models for most of the discussion, since these materials have been extensively studied recently using the bioassay and analytical methods pertinent to the central thrust of this presentation. However, it should be noted that approaches analogous to those discussed here are widely applicable to the general problem of determining genotoxins in complex mixtures of environmental concern. 36 references.

5604 Other Environmental Pollutant Effects

50071 **(LIS—21) Proposals of a method for areal sound power levels.** Strauch, H. (Landesanstalt fuer Immissionsschutz des Landes Nordrhein-Westfalen, Essen (Germany, F.R.)). 1982. 92p. (In German). Fachinformationszentrum Energie, Physik, Mathematik, Karlsruhe, Germany.

The level difference at field points has been determined which may arise between the free field noise level based on the assumption that all noise sources are concentrated in the center of the construction site and the noise level estimated by taking into account the actual distribution of the sound sources. The level difference was calculated for field points in the area surrounding the construction site at varying distances from its center and in different directions. The calculations were carried out for assumed theoretical sound power distributions as well as for distributions approximating those of existing large sites. Moreover, the dependence of the level difference on the shape of the construction site and the number of subunits into which a construction site can be partitioned was investigated. The most important result which deserves mentioning shows that the level difference assumes large values when the actually installed sound power on a construction site concentrates in one spot which is not the center of the site as required for the reference point for the prediction of the free field sound level with the aid of the areal sound power level. The results of the study are used to propose a method for determining the number of necessary subdivisions of a construction site and of the areal sound power level in the various subdivions in dependence of the distance and the direction of a field point with regard to the construction site as well as in dependence of noise limits which are to be met. In addition the size of the area for the establishment of new commercial and industrial enterprises is discussed as well as the noise emissions to be expected from them.

50072 **(MSHA/IR—1117) Improving barrier insertion loss.** Valoski, M.P. (Mine Safety and Health Administration, Pittsburgh, PA (USA). Pittsburgh Technical Support Center). 1980. 20p. NTIS, PC A02/MF A01. Order Number DE83902840.

This paper details two attempts at increasing barrier insertion loss by using two different systems of resonators attached to the edges of the barrier facing the noise source. The first system consists of quarter wavelength resonators and the second system consists of the quarter wavelength resonators containing fiberglass wedges. The system of quarter wavelength resonators was an attempt to achieve an acoustically soft edge condition. An acoustically soft edge condition theoretically can increase the insertion loss of a barrier up to 30 dB depending on the orientation of the noise source, receiver and barrier while a perfectly absorptive edge can increase the insertion loss when compared to a hard surfaced barrier up to 6 dB. The results indicate that both systems more closely approximate an absorptive edge condition than an acoustically soft edge condition. Noise control techniques developed in this report are most applicable to large stationary noise sources that contain pure tone components. Some examples of this type of noise sources in the mining industry are ventilation fans, power transformers, and vacuum pumps.

50073 **(UBA-FB—80-030) Exhaust gas tubes for cars with lower sound transmitted by air and with a decrease of outlet noise.** Dungs, G. (Umweltbundesamt, Berlin (Germany, F.R.)). Mar 1980. 77p. (In German). Fachinformationszentrum Energie, Physik, Mathematik, Karlsruhe, Germany.

Sound transmitted by air and the outlet noise of exhaust gas tubes are to be decreased for reducing the sound emission of vehicles in motion. Sound ranging in an acoustic chamber behind a screened motor as well as the outdoor measurements with vehicle in motion and frequency analyses are showing the acoustical properties of various special tubes and tube silencers. Acoustical uncoupling of the exhaust gas system from the motor reduces the sound transmitted by air and the vehicle noises in motion distinctly. A tube silencer with run under the whole body of the test car renders possible the same sound emission as the serial exhaust gas system. Combined with a regular muffler the tube silencer can support it and thus enables a reduction of sound emission. Superelastic compensators have to be optimised for getting a sufficient durability before entering the quantity production and tube silencers have to be developed in accordance of the special car and the industrial processing engineering.

57 HEALTH AND SAFETY

50074 **(AD-A—125404/4) FEMA (Federal Emergency Management Agency) database requirements assessment and resource directory model. Final report 24 Aug 81-15 May 82.** Tenopir, C.; Williams, M.E. (Illinois Univ., Urbana (USA). Coordinated Science Lab.). May 1982. 134p. NTIS MF A01.

Word-oriented databases (bibliographic, textual, directory, etc.) relevant to various units within the Federal Emergency Management Agency are identified and those of most potential relevance are analyzed. Subject profiles reflecting the interests of each major FEMA unit were developed and tested online on fifteen publicly available databases. The databases were then ranked by the number of citations pertinent to all aspects of emergency management and the number of pertinent citations per year of database coverage. Sample citations from the fifteen databases are included. A model Directory of Databases pertinent to emergency management was developed.

50075 **(INIS-BR—05) Proceedings of the Brazilian-German Symposium on Nuclear Reactor Safety.** (Comissao Nacional de Energia Nuclear de Brasil, Rio de Janeiro). Jun 1980. 458p. (CONF-8006205—). NTIS (US Sales Only), PC A21/MF A01. Order Number DE83781073.

From Brazilian-German symposium on Nuclear Reactor Safety; Rio de Janeiro, Brazil (16 Jun 1980).

Individual papers are included in the data bases. (PSB)

50076 **(MESA-IR—1024) Analysis of injuries involving jackleg rock drills underground, 1973-1974.** Oitto, R.H. (Mining Enforcement and Safety Administration, Denver, CO (USA). Health and Safety Analysis Center). 1975. 18p. NTIS, PC A02/MF A01. Order Number DE83903043.

Rock drills caused 31 percent of the injuries involving machinery in underground metal and nonmetallic mines in the United States during 1973-1974. The jackleg rock drill produced more injuries (316 or 55 percent) than any other type of rock drill. The injuries from jacklegs fit into three general categories: setting up to drill, collaring a hole, and drilling a hole. Most of the injuries occurred during hole drilling and happened to workers who used a jackleg regularly in their work, indicating that either the jackleg is inherently unsafe or that many operators are not properly trained to use them, or both. Based on information from injury reports and from interviews with jackleg operators and safety personnel in the mining industry and Mining Enforcement and Safety Administration (MESA) safety guidelines for the jackleg operation are presented in this report.

50077 **(MESA-IR—1086) Injury experience in the metallic mineral industries, 1973.** (Mining Enforcement and Safety Administration, Denver, CO (USA). Health and Safety Analysis Center). 1978. 76p. NTIS, PC A05/MF A01. Order Number DE83902782.

Portions are illegible in microfiche products.

This report reviews in detail the occupational injury and illness experience of the metallic mineral industries in the United States for 1973. Data reported by operators of mining establishments are summarized in a total of 37 tables by work location, principal cause of injury, part of body injured, and nature of injury. Correlative information on employment, worktime, and operating activity also is presented in the tabulations. Concise historical information is shown for the period 1931 through 1973 for mines and from 1945 through 1973 for mills.

50078 **(MESA-IR—1089) Injury experience in the sand and gravel industry, 1974.** (Mining Enforcement and Safety Administration, Denver, CO (USA). Health and Safety Analysis Center). 1978. 27p. NTIS, PC A03/MF A01. Order Number DE83902779.

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This report reviews injury experience in the sand and gravel industry of the United States in 1974. There are 14 tables in which work injuries and illnesses are summarized by general work location, severity of injury, principal cause of injury, part of body injured, and nature of injury. Correlative information on employment, worktime, and operating activity also is presented in the tabulations.

50079 **(MSHA/IR—1105) Impact of the metal/nonmetal Special Accident-Prevention Program for fiscal year 1976.** Kogut, J. (Mine Safety and Health Administration, Pittsburgh, PA (USA). Pittsburgh Technical Support Center). 1979. 17p. NTIS, PC A02/MF A01. Order Number DE83902841.

Portions are illegible in microfiche products.

This report examines the impact of the Mining Enforcement and Safety Administration's Special Accident Prevention Program for FY 76 on the risk of disabling injury in the metal and nonmetal mining industries. The statistical significance of the observed decline in disabling injury frequency rate at mines and mills in the program is evaluated. Much of the decline was associated with normal inspection activity and time-related factors not specifically associated with the program. However, a statistically significant part of the improvement was associated with increased inspection; and in those operations which actively cooperated with the program, an identifiable portion of the improvement can be associated with the program itself.

50080 **(MSHA/IR—1116) Injury experience in metallic mineral mining, 1978.** (Mine Safety and Health Administration, Denver, CO (USA). Health and Safety Analysis Center). 1979. 246p. NTIS, PC A11/MF A01. Order Number DE83902850.

Portions are illegible in microfiche products.

This report reviews in detail the occupational injury and illness experience of metallic mineral mining in the United States for 1978. Data reported by operators of mining establishments concerning work injuries are summarized by work location, accident classification, part of body injured, nature of injury, occupation, and principal kind of mineral. Correlative information on employment, worktime, and operating activity also is presented.

50081 **(MSHA/IR—1119) Explosion hazard in mining.** Nagy, J. (Mine Safety and Health Administration, Arlington, VA (USA)). 1981. 75p. NTIS, PC A04/MF A01. Order Number DE83902817.

This overview of surface- and underground-mine ignitions and explosions summarizes information from a variety of sources, including inspectors', disaster, and research reports, often not readily available to the general public. It is meant to assist mine operators, miners, inspectors, and others in combating these hazards by presenting lessons learned from past disasters and from research, especially the extensive laboratory and large-scale tests made since

1910 by the Bureau of Mines. With emphasis on the causes of ignitions and explosions in underground coal mines, the report presents statistics on accidents and fatalities; discusses ignition sources, flame propagation, pressure development, and explosion control; and compares methane and coal-dust explosions.

50082 **(PB—83-178301) Program of the National Institute for Occupational Safety and Health: program plans by program areas for fiscal year 1981.** (National Inst. for Occupational Safety and Health, Cincinnati, OH (USA)). Dec 1980. 239p. NTIS, PC A11/MF A01.

The current responsibilities of the National Institute for Occupational Safety and Health were established primarily by the Public Health Service Act, the Occupational Safety and Health Act of 1970, and the Federal Mine Safety and Health Act of 1977. A major NIOSH responsibility under these Acts is to conduct research necessary to ensure, insofar as possible, that no worker will suffer diminished health, reduced functional capacity, or decreased life expectancy as a result of his or her work experience. This document outlines NIOSH's Program Plan for in-house and extramural projects for FY 1981 (October 1, 1980 through September 30, 1981).

50083 **(PB—83-178822) Good practice manual for insulation installers.** (National Inst. for Occupational Safety and Health, Cincinnati, OH (USA)). Aug 1977. 40p. (DHEW/PUB/NIOSH—77-188). NTIS, PC A03/MF A01.

This Good Practices Manual has been prepared for insulation installers to help them become more aware of some of the potential hazards of their day-to-day work so that they won't become a statistic. Not every insulation installer will encounter every hazard discussed. Nor are these hazards the only ones that the worker may face on the job. But the more workers know about the hazards or potential hazards of a job the safer they can work. If they cannot stay away from the hazard, they can learn a step by step procedure designed to lessen the hazard, including wearing protective clothing as instructed.

50084 **(PB—83-181099) Pilot control technology assessment of chemical reprocessing and reclaiming facilities. Walk-through survey report of Solvent Resource Recovery, Inc., West Carrollton, Ohio.** Crandall, M.S. (National Inst. for Occupational Safety and Health, Cincinnati, OH (USA). Div. of Physical Sciences and Engineering). 13 May 1982. 17p. NTIS, PC A02/MF A01.

Solvent Resource Recovery, Inc., produces clean solvents from both chlorinated and non-chlorinated waste solvents collected from suppliers within a 300 mile radius. The chlorinated products include methylene chloride, 1,1,1-trichloroethane, trichloro ethane, and tetrachloroethene. The non-chlorinated products are blends from acetone to the higher boiling naphthas which vary depending on the supplier. The solvent recovery operations at SRR are modern and apparently well controlled. This is a clean and efficiently run plant. This company exhibited a conscientious attitude toward safety and a growing concern for worker health. Conspicuously lacking, however, were industrial hygiene monitoring data to confirm the effectiveness of control technologies being used.

50085 **(UCRL—89089) System safety: a reality at a national laboratory.** Morse, J.L. (Lawrence Livermore National Lab., CA (USA)). 15 Jul 1983. Contract W-7405-ENG-48. 11p. (CONF-8309115—3). NTIS, PC A02/MF A01. Order Number DE83016564.

From 6. international system safety conference; Houston, TX, USA (26 Sep 1983).

Intensive system safety efforts during the past several years at the Lawrence Livermore National Laboratory have brought health and safety considerations into the earliest planning of major new projects. These efforts included organizational changes with fundamental top management philosophical changes, better integration of health and safety disciplines into the design team, and routine use of system safety analysis techniques. Tangible benefits include more harmony between the Safety Department and project management, earlier and higher quality safety inputs, plus documentation of safety design rationale. Specific system safety techniques used at LLNL are preliminary hazards analysis, failure mode and effects analysis, fault tree analysis, operational hazards analysis, and various MORT techniques including occupancy-use readiness trees. The Department of Energy (DOE) has recognized the merit of this approach with the recent DOE Order 5481.1 which requires department-wide application of system safety principles.

58 GEOSCIENCES

50086 **(INIS-mf—8134) Condensed report of activities in the period September 1980 to the end of 1981.** (Laboratorium voor Isotopen-Geologie, Amsterdam (Netherlands)). 14 Jul 1982. 22p. (In Dutch). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702819.

This progress report includes concise, individual reports from the following groups: mineralogy and mineral separation, X-ray analysis, chemistry, mass spectrometry, electronics and the computer, alpha spectrometry, and fission track dating. Publications from staff members are listed, details of the personnel are given and financial overviews for 1979, 1980 and 1981 are presented.

5801 Geology And Hydrology

REFER ALSO TO CITATION(S) 48684

50087 **(DOE/EV/70001—T3) Sedimentary processes in Boca de Quadra and Smeaton Bay: preliminary evidence from excess ^{210}Pb and interstitial-water chemistry.** Sugai, S.F.; Burrel, D.C. (Alaska Univ., Fairbanks (USA)). 1979. Contract AT06-76EV70001. 18p. NTIS, PC A02/MF A01. Order Number DE83016513.

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Sedimentary profiles of unsupported ^{210}Pb (t/sub 1/2/ = 22.26 years) coupled with profiles of redox-sensitive metals in the interstitial water suggest sedimentary processes that have occurred in Boca de Quadra and Smeaton Bay within the past several decades. Although average sedimentation rates can be calculated from excess ^{210}Pb profiles alone, ancillary information is needed to interpret the history recorded in the sedimentary column. Particularly in dynamic environments such as the fjords examined here, it is necessary to examine the combined effects of: (1) rapid deposition of sediment by slumping or major storms; (2) erosional events such as scouring; (3) homogenization of sediment by storm mixing or bioturbation; and (4) deposition of material from a different source. In this report we discuss efforts underway to examine the events responsible for the observed profiles of excess ^{210}Pb in the sediment of Boca de Quadra and Smeaton Bay.

50088 **(SKBF-KBS-SP-IR—82-04) Core-logs of the subhorizontal boreholes N1 and E1.** Carlsson, L.; Stejskal, V.; Olsson, T. (Svensk Kaernbraenslefoersoerjning AB, Stockholm). Aug 1982. 46p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702340.

The subhorizontal boreholes N1 and E1 were drilled in the monzogranite of the Stripa pluton for purposes of the hydrogeological investigations. This report presents the results of the megascopic petrographic investigation of the cores and fracture measurements compiled as fracture-logs, RQD-diagrams, cumulative fracture diagram and contour diagrams of oriented fracture measurements. It also describes geologic structures connected with the Stripa pluton.

50089 **(SKBF-KBS-SP-IR—82-05) Core-logs of the vertical borehole V2.** Carlsson, L.; Egerth, T.; Westlund, B.; Olsson, T. (Svensk Kaernbraenslefoersoerjning AB, Stockholm). Aug 1982. 42p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702341.

In the hydrogeological programme of the Stripa Project, borehole V2 was extended to a final depth of 822 m. The previous core from 0-471.4 m was relogged. The drill core was logged with regard to rock characteristics, fracture frequency, dipping and filling. The results are presented as core-logs and fracture diagrams. Borehole V2 shows similar characteristics as found in other drillings in the Stripa Mine. It penetrates Stripa granite to its full depth. Recorded fractures shows a clear predominance of medium-steep

fractures, while flat-lying fractures are more sparsly occuring, a fact which is even more pronounced below 400 m depth. Due to the vertical direction of the borehole, steeply dipping fractures are underestimated in the core. The mean fracture frequency, related to the total length of the core, is 2.1 fractures/m. Chlorite, calcite and epidote are the dominating coating minerals in the fractures, each making up about 25-30 percent of all coated fractures.

50090 **(SKBF-KBS-TR—82-10) Hydraulic properties of fracture zones and tracer tests with non-reactive elements in Studsvik.** Klockars, C.-E.; Persson, O.; Landstroem, O. (Svensk Kaernbraenslefoersoerjning AB, Stockholm). Apr 1982. 41p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702310.

Tracer technique was applied in a rock formation within the Studsvik Energiteknik area in order to study hydrodynamic properties of discrete fracture zones between boreholes. The two hole method was applied in these studies; a nonreactive tracer is injected in one hole into a fracture zone which is in hydraulic contact with a central pump hole (observation hole). Hydraulic tests and TV inspection were carried out in the fracture zones. Chemical composition of the groundwater was determined. In summary, the following hydraulic properties were found for the fracture zones between the boreholes B1N-B6N and B5N-B6N respectively, under the prevailing conditions: 1) The fracture zones studied consists of a number of transport pathways with different mean transit times, varying from 100 to 1200 hours. 2) The fracture zone between boreholes B1N and B6N has a mean hydraulic conductivity of 6-7 x 10^{-5} m/s and the fracture zone between boreholes B5N and B6N, 2 x 10^{-4} m/s. 3) The kinematic porosity of the fracture zones studied, calculated as the ratio between the hydraulic conductivity of the rock mass and that of the fracture zone, is 2 x 10^{-3} and 5 x 10^{-3}, respectively. 4) The roughness factor β, which expresses the ratio between measured and theoretically calculated (plane-parallel) fracture conductivity for the fracture zones studied, is approximately 0.04 and 0.06, respectively. 5) Dispersivity for the flow channels within the fracture zones is of the order of 0.3-0.8 m. 6) The groundwater encountered is a nearly neutral, probably reducing, Na-Ca-HCO_3 water. The results of the tracer tests reveal the following: I-131 is a suitable nonreactive tracer for the test area. A test with simultaneous injection of I-131 and T (tritium) gave comparable breakthrough curves.

5802 Geophysics

REFER ALSO TO CITATION(S) 48591, 48743, 50088, 50089

50091 **(DOE/ER/70006—T6-9) Operation of a telemetered seismic network on the Alaska Peninsula. Final report.** (Alaska Univ., Fairbanks (USA). Geophysical Inst.). Jul 1983. Contract AT06-76ER70006. 29p. (RLO—2229-T6-9). NTIS MF A01. Order Number DE83016673.

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The purpose was the installation and operation of a seismic network to provide data for the investigation into the seismotectonics of the eastern portion of the Alaska-Aleutian arc. This paper gives an overview of the program and presents an earthquake catalogue and results of studies based on the network. (ACR)

50092 (IA—1375, pp 213-214) **Use of geodetic information in investigating surface dislocations.** Striem, H.L. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

50093 (IA—1375, pp 214-215) **Evaluation of macroseismic information in nuclear siting investigations.** Striem, H.L. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

50094 **(USGS-OFR—83-399) Sourcebook of locations of geophysical surveys in tunnels and horizontal holes including results of seismic-refraction surveys: Rainier Mesa, Aqueduct Mesa, and Area 16, Nevada Test Site.** Carroll, R.D.; Kibler, J.E. (Geological Survey, Denver, CO (USA)). 1983. Contract AI08-76DP00474. 125p. NTIS, PC A07/MF A01. Order Number DE83016216.

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Seismic refraction surveys have been obtained sporadically in tunnels in zeolitized tuff at the Nevada Test Site since the late 1950's. Commencing in 1967 and continuing to date (1982), extensive measurements of shear- and compressional-wave velocities have been made in five tunnel complexes in Rainier and Aqueduct Mesas and in one tunnel complex in Shoshone Mountain. The results of these surveys to 1980 are compiled in this report. In addition, extensive horizontal drilling was initiated in 1967 in connection with geologic exploration in these tunnel complexes for sites for nuclear weapons tests. Seismic and electrical surveys were conducted in the majority of these holes. The type and location of these tunnel and borehole surveys are indexed in this report. Synthesis of the seismic refraction data indicates a mean compressional-wave velocity near the nuclear device point (WP) of 23 tunnel events of 2430 m/s (7970 f/s) with a range of 1846 to 2753 m/s (6060 to 9030 f/s). The mean shear-wave velocity of 17 tunnel events is 1276 m/s (4190 f/s) with a range of 1140 to 1392 m/s (3740 to 4570 f/s). Experience indicates that these velocity variations are due chiefly to the extent of fracturing and (or) the presence of partially saturated rock in the region of the survey.

5803 Mineralogy, Petrology, And Rock Mechanics

REFER ALSO TO CITATION(S) 48563, 48592, 48669, 48673, 48703, 48728

50095 **(UCRL—53424) Feasibility of using sonic techniques to estimate in-situ stresses.** Mao, N.; Sweeney, J.; Hanson, J.; Costantino, M. (Lawrence Livermore National Lab., CA (USA)). 1 Jun 1983. Contract W-7405-ENG-48. 55p. NTIS, PC A04/MF A01. Order Number DE83016890.

This report presents the results of a three-year research effort to develop a technique for estimating in situ stresses by measuring stress-induced velocity anisotropy around a borehole. Relevant parameters required to make the estimate were identified and measured in the laboratory on a 35.6-cm cube of Nugget sandstone with a 10.2-cm diameter hole, under biaxial loading. The major technical obstacle to this study was the design of a transducer system for generating radially and tangentially polarized shear waves in a borehole configuration; the final design utilized a transducer/wedge assembly to generate refracted waves. Two pairs each of radially and tangentially polarized transducers were placed inside the 10.2-cm hole with displacement directions either parallel or perpendicular to the principal stress directions. With this configuration, relative travel times were measured by both a pulsed phase-locked loop technique and a cross correlation of digitized waveforms. Results from each technique show very good agreement, which indicates the validity of the approach. The uncertainty of timing was about 0.03 μs for an individual file. The biaxial test data were used to calculate the applied stress. The standard deviation of the differences between the calculated and applied stresses is 0.62 MPa for a stress level up to 8.63 MPa. Based on the success of the laboratory measurement, the authors recommend that this research be pursued towards implementing a field procedure for estimating in situ stresses. 26 references.

50096 **(UCRL—89414) Quantitative determination of minerals in Nevada Test Site samples by x-ray diffraction.** Pawloski, G.A. (Lawrence Livermore National Lab., CA (USA)). Jul 1983. Contract W-7405-ENG-48. 22p. (CONF-830882—5). NTIS, PC A02/MF A01. Order Number DE83016574.

From 2. containment symposium; Albuquerque, NM, USA (2 Aug 1983).

The external standard intensity ratio technique has been developed into a routine procedure for quantitatively determining mineralogic compositions of Nevada Test Site (NTS) samples by x-ray diffraction. This technique used ratios of x-ray intensity peaks

from the same run which eliminates many possible errors. Constants have been determined for each of thirteen minerals commonly found in NTS samples - quartz, montmorillonite, illite, clinoptilolite, cristobalite, feldspars, calcite, dolomite, hornblende, kaolinite, muscovite, biotite, and amorphous glass. Ratios of the highest intensity peak of each mineral to be quantified in the sample and the highest intensity peak of quartz are used to calculate sample composition. The technique has been tested on samples with three to eleven components representative of geologic environments at NTS, and is accurate to 7.0 wt % of the total sample. The minimum amount of each of these minerals detectable by x-ray diffraction has also been determined. QUANTS is a computer code that calculates mineral contents and produces a report sheet. Constants for minerals in NTS samples other than those listed above can easily be determined, and added to QUANTS at any time.

5804 Geochemistry

REFER ALSO TO CITATION(S) 48669, 48708

50097 **(INIS-BR—04) Preliminary studies on fluid inclusions in metasomatic albite grains from Lagoa Real, Caetite, Ba, Brazil.** Fuzikawa, K. (NUCLEBRAS, Belo Horizonte (Brazil)). 1980. 12p. (In Portuguese). (CONF-8010318—16). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702759.

From 31. Brazilian congress of geology; Camboriu, Santa Catarine, Brazil (19 Oct 1980).

Preliminary fluid inclusion studies in metasomatic albite grains from the Lagoa Real uranium deposit pointed out to mixing of strong brines (23 wt% NaCl equivalent) with low salinity fluids (2.3 wt% NaCl equivalent). Microthermometry and crushing tests indicated elevated pressures and the presence of hydrocarbons in larger amount than CO_2. The remobilization of uranium as uranyl carbonate complexes and its precipitation, reducing U^{6+} to U^{4+} by CH_4, is considered as a possibility.

50098 **(ZfI-Mitt—52) Application of the isotopic index in isotope geochemical investigation.** (Akademie der Wissenschaften der DDR, Leipzig. Zentralinstitut fuer Isotopen- und Strahlenforschung). Jul 1982. 58p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83781035.

Abstracts of individual items from the study were prepared separately for the data base. (GHT)

50099 **(ZfI-Mitt—53) Application of the isotopic index in isotope geochemical investigation.** Schuetze, H. (Akademie der Wissenschaften der DDR, Leipzig. Zentralinstitut fuer Isotopen- und Strahlenforschung). Jun 1982. 116p. (In German). NTIS (US Sales Only), PC A06/MF A01. Order Number DE83702404.

A method is described which allows to calculate approximately isotope exchange equilibria between different crystalline silicates. The algorithm uses a newly introduced isotopic index. It is defined using isotopic increments of the variant types of silicatic bonds. This isotopic index gives a quantitative measure of the ability to enrich ^{18}O or ^{30}Si, respectively. The dependence of isotopic fractionations on temperature can be calculated approximately by means of the isotopic index, too. On this theoretical base some problems of magmatism and two varieties of an isotope geochemical model of the evolution of the Earth's crust are treated. Finally, the possibility is demonstrated to give prognostic statements about the likelihood of ore bearing of different granites.

5805 Oceanography

REFER ALSO TO CITATION(S) 49871

64 PHYSICS RESEARCH

50100 **(RISO-R—461) Physics Department annual progress report. 1 January - 31 December 1981.** Moeller, H.B.; Lebech, B. (eds.). (Risoe National Lab., Roskilde (Denmark)). Dec 1981. 204p. NTIS (US Sales Only), PC A10/MF A01. Order Number DE83702450.

Research in the Physics Department at Risoe covers three main fields: solid-state physics; plasma physics; meteorology. The principal activities in these fields are presented in this report, which covers the period from 1 January to 31 December 1981. Introductions to the work in each of the main fields are given in the respective sections of the report.

50101 **Physics for Australia's development. 2nd applied physics conference of the Australian Institute of Physics.** Sydney, Australia; A.I.P. (1981). vp. (CONF-811279—).

From 2. applied physics conference of the Australian Institute of Physics; Melbourne, Australia (1 Dec 1981).

Abstracts of individual items from the conference were prepared separately for the data base. (GHT)

6401 Astrophysics And Cosmology

REFER ALSO TO CITATION(S) 50180, 50180, 50254, 50263, 50344, 50361

50102 **(CEA-CONF—6568) Gamma rays from active regions in the galaxy: the possible contribution of stellar winds.** Cesarsky, C.J.; Montmerle, Thierry. (CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France)). Aug 1982. 38p. (CONF-8208107—2). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83703398.

From 18. general assembly of the International Astronomical Union; Patras, Greece (17 Aug 1982).

Massive stars release a considerable amount of mechanical energy in the form of strong stellar winds. A fraction of this energy may be transferred to relativistic cosmic rays by diffusive shock acceleration at the wind boundary, and/or in the expanding, turbulent wind itself. Massive stars are most frequently found in OB associations, surrounded by H II regions lying at the edge of dense molecular clouds. The interaction of the freshly accelerated particles with matter gives rise to γ-ray emission. In this paper, we first briefly review the current knowledge on the energetics of strong stellar winds from O and Wolf-Rayet stars, as well as from T Tauri stars. Taking into account the finite lifetime of these stars, we then proceed to show that stellar winds dominate the energetics of OB associations during the first 4 to 6 million years, after which supernovae take over. In the solar neighborhood, the star formation rate is constant, and a steady-state situation prevails, in which the supernova contribution is found to be dominant. A small, but meaningful fraction of the CO S-B γ-ray sources may be fueled by WR and O stellar winds in OB associations, while the power released by T Tauri stars alone is perhaps insufficient to account for the γ-ray emission of nearby dark clouds. Finally, we discuss some controversial aspects of the physics of particle acceleration by stellar winds.

50103 **(CEA-CONF—6574) X-ray spectrum of the cluster A 576.** Rothenflug, R.; Vigroux, L.; Mushotzky, R.F.; Holt, S.S. (CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France)). Oct 1982. 6p. (CONF-8210154—1). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703399.

From European colloquium on clusters of galaxies; Meudon, France (13 Oct 1982).

We report results of Einstein Solid State Spectrometer observations of the central region of Abell 576. We detected line emission due to Fe, Si and S from a hot (approximately 2.10^7 °K) plasma in the central region. The temperature of the total cluster spectrum seems hotter than the central temperature. This difference can be explained either if cooling takes place in the center, either if part of the measured emission is due to individual galaxies. If the X-ray emission comes from the intergalactic gas only, there is some difficulties to reproduce all silicon observed by the galaxies of A 576.

50104 **(DOE/ER/40048—61) Cross sections relevant to gamma-ray astronomy: alpha-particle-induced reactions.** Seamster, A.G.; Norman, E.B.; Leach, D.D.; Dyer, P.; Bodansky, D. (Washington Univ., Seattle (USA). Nuclear Physics Lab.). 1983. Contract AC06-81ER40048. 35p. NTIS, PC A03/MF A01. Order Number DE83015533.

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Gamma-ray production cross sections have been measured for the gamma-ray lines most strongly excited in the alpha-particle bombardments of ^{20}Ne, ^{24}Mg, ^{27}Al, ^{28}Si, and ^{56}Fe for alpha-particle energies from threshold to approximately 27 MeV. Tabulations of cross sections averaged over alpha-particle energy bins of 1 MeV are provided for calculations relevant to gamma-ray line astronomy. Examples are given of astrophysical information which might be extracted from spectra acquired with gamma-ray spectrometers in space using these cross sections.

50105 **(IC—81/221) Vacuum instability in the Einstein open metric.** Denardo, G.; Spallucci, E. (International Centre for Theoretical Physics, Trieste (Italy)). Nov 1981. 27p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702241.

We study phase transitions in the background of an open, static, Einstein universe. The one loop effective potential is computed both at zero and at finite temperature. The interplay between critical temperature and curvature is exploited. We show that in such a geometry the spontaneously broken symmetric phase is favoured at high curvature.

50106 **(IC—82/119) Question of an upper bound on entropy.** Qadir, A. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1982. 7p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702459.

We discuss the possibility, and significance, of an upper bound on entropy in the light of the arguments of Bekenstein and Unruh and Wald. We obtain a stricter bound than Bekenstein does, and point out some limitations with regard to its significance.

50107 **(N—8317435) Type 2 radio bursts, interplanetary shocks and energetic particle events.** Cane, H.V.; Stone, R.G. (National Aeronautics and Space Administration, Greenbelt, MD (USA). Goddard Space Flight Center). Nov 1982. 30p. (NASA-TM—84941). NTIS, PC A03/MF A01.

Using the ISEE-3 radio astronomy experiment data 37 interplanetary (IP) type II bursts have been identified in the period September 1978 to December 1981. These events and the associated phenomena are listed. The events are preceded by intense, soft X ray events with long decay times (LDEs) and type II and/or type IV bursts at meter wavelengths. The meter wavelength type II bursts are usually intense and exhibit herringbone structure. The extension of the herringbone structure into the kilometer wavelength range results in the occurrence of a shock accelerated (SA) event. The majority of the interplanetary type II bursts are associated with energetic particle events. These results support other studies which indicate that energetic solar particles detected at 1 A.U. are generated by shock acceleration. From a preliminary analysis of the available data there appears to be a high correlation with white light coronal transients.

50108 **Radiation length in air.** Linsley, J. (University of New Mexico, Albuquerque, NM (USA)). pp 246-249 of Conference papers. 17. International cosmic ray conference. Vol. 11, HE, EA late papers. Paris, France; Commissariat a l'Energie Atomique (1982). (CONF-810711—Vol.11).

From 17. international cosmic ray conference; Paris, France (13 Jul 1981).

It is confirmed, in case of nitrogen, that the radiation length t_0 calculated for a Thomas-Fermi distribution of the electron cloud is within 0.6% of the correct value, i.e. the value calculated using accurate self-consistent orbital wavefunctions (Wheeler and Lamb 1939). It is shown that the method used by Genannt and Pilkuhn (1973) to calculate tsub(coh) (which gave values of t_0 for N_2 and O_2) that were 5% less than those assuming Thomas-Fermi molecular nitrogen is about 1% greater than for atomic nitrogen. The best value to use at present for t_0(air) is 36.1g/cm^2, the Thomas-Fermi value (without any molecular binding correction).

50109 **Search for nucleon decay with a deep underground water Cerenkov detector.** Cherry, M.L.; Deakyne, M.; Lande, K.; Lee, C.K.; Steinberg, R.I. (University of Pennsylvania, Philadelphia, PA (USA)); Cleveland, B. (Brookhaven National Laboratory, Upton, N.Y. (USA)). pp 218-221 of Conference papers. 17. International cosmic ray conference. Vol. 11, HE, EA, late papers. Paris, France; Commissariat a l'Energie Atomique (1982). (CONF-810711—Vol.11).

From 17. international cosmic ray conference; Paris, France (13 Jul 1981).

We report the initial result of a search for nucleon decay using a 300 ton water Cerenkov detector located 1480 m underground in the Homestake Gold Mine, Lead, S.D. we find Tsub(N) $> 2.4 \times 10^{31}$ Bsub(μ) yrs, where Tsub(N) is t lifetime and Bsub(μ) is the model-dependent probability of producing and detecting a stopping and decaying muon following a nucleon decay event. In the SU(5) grand unified model, calculations of Bsub(μ) vary from 5 to 10%, yielding nucleon lifetime limits ranging from 1 to 2 x 10^{30} yrs.

50110 **Nature of symbiotic stars. Proceedings of IAU Colloquium No. 70 held at the Observatoire de Haute Provence, 26-28 August, 1981.** Friedjung, M.; Viotti, R. (eds.). Dordrecht, Netherlands; D. Reidel (1982). vp. (CONF-8108161—).

From 70. IAU colloquium on the nature of symbiotic stars; Provence, France (26 Aug 1981).

Abstracts of individual items from the proceedings were prepared separately for the data base. (GHT)

6402 Atmospheric Physics

50111 (RISO-R—472, pp 60-64) **Negative resistivity of double layers.** Raadu, M.A.; Silevitch, M.B. (Royal Inst. of Tech., Stockholm (Sweden)). Sep 1982. NTIS (US Sales Only), PC A13/MF A01. (CONF-8206176—).

From Symposium on plasma double layer; Roskilde, Denmark (16 Jun 1982).

Silevitch (J. Geophys. Res. 86, 3573; 1981) suggested an explanation for the flickering aurora phenomenon. He showed by a variational method that a plausible analytic model for a double layer (DL) behaved as a negative resistance on the tausub(e) scale. The authors reexamine the Silevitch (1981) results by taking a more detailed account of the constraints which are imposed on the various electron distributions which exist within the DL region.

50112 (RISO-R—472, pp 77) **Double layer induced auroral kilometric radiation.** Bujarbarua, S. (Dibrugarh Univ. (India). Dept. of Physics); Nambu, M. (Kyushu Univ., Fukuoka (Japan)). Sep 1982. NTIS (US Sales Only), PC A13/MF A01. (CONF-8206176—).

From Symposium on plasma double layer; Roskilde, Denmark (16 Jun 1982).

50113 (RISO-R—472, pp 255-273) **Double layers in space.** Carlqvist, P. (Royal Inst. of Tech., Stockholm (Sweden). Dept. of Plasma Physics). Sep 1982. NTIS (US Sales Only), PC A13/MF A01. (CONF-8206176—).

From Symposium on plasma double layer; Roskilde, Denmark (16 Jun 1982).

For more than a decade it has been realised that electrostatic double layers are likely to occur in space. The author briefly discusses the theoretical background of such double layers. Most of the paper is devoted to an account of the observational evidence for double layers in the ionosphere and magnetosphere of the Earth. Several different experiments are reviewed including rocket and satellite measurements and ground based observations. It is concluded that the observational evidence for double layers in space is very strong. The experimental results indicate that double layers with widely different properties may exist in space.

50114 (RISO-R—472, pp 274-278) **Formation of double layers on auroral field lines.** Lysak, R.; Lotko, W.; Hudson, M.; Witt, E. (California Univ., Berkeley (USA). Space Sciences Lab.). Sep 1982. NTIS (US Sales Only), PC A13/MF A01. (CONF-8206176—).

From Symposium on plasma double layer; Roskilde, Denmark (16 Jun 1982).

In contrast to the situation in laboratory plasmas and computer simulations, double layers in naturally occurring plasmas exist far from the imposed boundary conditions. Consequently, their formation and dynamics involve an interplay between microscopic and macroscopic plasma conditions. In this context, it is of interest to consider the nature of double layers which occur in a plasma environment where particle populations of radically different origin mix, where the macroscopic dynamics cause temporal variations in the local plasma parameters, and where a state of stationary plasma turbulence may persist well beyond the double layer lifetime. Such an environment occurs at several thousand kilometer altitudes over the Earth's auroral zone.

50115 (RISO-R—472, pp 279) **Space observations relevant to laboratory double layers, shocks and solitons - the plasmapause and high latitude holes.** Kikuchi, H. (Nihon Univ., Tokyo (Japan). College of Science and Technology). Sep 1982. NTIS (US Sales Only), PC A13/MF A01. (CONF-8206176—).

From Symposium on plasma double layer; Roskilde, Denmark (16 Jun 1982).

6403 Atomic, Molecular, And Chemical Physics

REFER ALSO TO CITATION(S) 50265, 50266, 50274

50116 (AAEC/E—541) **SPUTLIB - a library of Maxwellian-averaged sputtering coefficients.** Cook, J.L.; Rose, E.K. (Australian Atomic Energy Commission Research Establishment, Lucas Heights). Jul 1982. 39p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702511.

A general law of sputtering coefficients as a function of hydrogen and helium ion energies that are incident on metallic walls is given. The average over a Maxwellian spectrum is carried out analytically. A library of such coefficients is presented in the ADL-1 format.

50117 (BNL—33379) **Theory of hyperfine anomalies in muonic atoms.** Freeman, A.J.; Mallow, J.V.; Desclaux, J.P.; Weinert, M. (Northwestern Univ., Evanston, IL (USA). Dept. of Physics and Astronomy; Loyola Univ., Chicago, IL (USA). Dept. of Physics; CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France). Dept. de Recherche Fondamentale; Brookhaven National Lab., Upton, NY (USA)). 1983. Contract AC02-76CH00016. 12p. (CONF-830455—8). NTIS, PC A02/MF A01. Order Number DE83015392.

From Yamada conference on muon spin rotation and associated problems; Shimoda, Japan (18 Apr 1983).

Portions are illegible in microfiche products.

Negative muon spin precession experiments by Yamazaki, et al. have found giant hyperfine anomalies in muonic atoms ranging from a few percent up to 36%. In order to understand their results, we present Breit interaction calculations based on atomic self-consistent unrestricted Dirac-Fock solutions which explicitly include all electrons and the negative muon. The Breit interaction results (including the relativistic correction for the bound muon g-factor), vary from near zero for μ^- O/N to -5% for μ^- Pd/Rh; this latter is much larger than the calculated muonic or nuclear Bohr-Weisskopf anomalies and much smaller than the 36% measured value. For μ^- Ni/Co we find a calculated range of results (depending on assumed electronic configurations) of -2.3 to -2.7% in excellent agreement with recent measurements of the Yamazaki group. This excellent agreement in μ^- Ni/Co provides strong support for the earlier suggestions that the discrepancy in the case of μ^- Pd/Rh is due to experimental factors.

50118 (CONF-830772—2) **Implications of heavy-ion induced satellite x-ray emission. I. Introduction.** Raman, S.; Vane, C.R. (Oak Ridge National Lab., TN (USA)). 1983. Contract W-7405-ENG-26. 23p. NTIS, PC A02/MF A01. Order Number DE83015682.

From 3. international conference on particle-induced X-ray emission (PIXE) and its analytical applications; Heidelberg, F.R. Germany (18 Jul 1983).

Regardless of how they are induced, x-ray spectra are sensitive to the chemical environment of the emitting atom and can yield information on the atomic and electronic structure of host materials. Those spectra resulting from light ion and heavy ion excitations are the main topics covered in this series of papers. Highly energetic heavy ions are capable of producing multiple innershell ionization. The resulting spectrum of x-rays from a particular target atom is composed of a complex series of satellite lines. Environmental effects give rise to the redistribution of intensity from one satellite group to another. These changes can be correlated with one satellite group to another. These changes can be correlated with bulk chemical properties (valence electron densities, effective charges, covalencies, etc.). The possibility of obtaining new chemical information (for example, in implanted materials and in metal alloys) exists but requires greater experimental and theoretical understanding of both parametric variations and the fine structure of satellite lines.

50119 (CONF-830772—3) **Implications of heavy-ion-induced satellite x-ray emission. III. Chemical effects in high resolution sulfur K/sub α/ x-ray spectra.** Vane, C.R.; Hulett, L.D. Jr.; Kahane, S.; McDaniel, F.D.; Milner, W.T.; Raman, S.; Rosseel, T.M.; Slaughter, G.G.; Varghese, S.L.; Young, J.P. (Oak Ridge National Lab., TN (USA)). 1983. Contract W-7405-ENG-26. 17p. NTIS, PC A02/MF A01. Order Number DE83015699.

From 3. international conference on particle-induced X-ray emission (PIXE) and its analytical applications; Heidelberg, F.R. Germany (18 Jul 1983).

High resolution (~ 7 eV at 2.3 keV) sulfur K/sub α/ x-ray spectra have been obtained for a series of sulfur compound targets under heavy ion impact at the Holified Heavy Ion Facility. The spectra observed are dominated by a series of satellite peaks arising from varying degrees of L-shell ionization at the time of x-ray emission. Each spectral profile has been parameterized by a single variable p/sub L/, the apparent average L-shell ionization probability. Correlations are evident between p/sub L/ and the corresponding sulfur atom chemical environment. Much stronger correlations are however found for variations of some individual peak intensities with specific chemical parameters. Comparison of results for Ar/sup q+/ and Kr/sup q+/ projectiles shows that while L-shell ionization probability has increased, chemical sensitivity has apparently saturated.

50120 (DL/SCI/R—18, pp 1-7) **Quantum defect theory and asymptotic methods.** Seaton, M.J. (University Coll., London (UK). Dept. of Physics and Astronomy). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

It is shown that quantum defect theory provides a basis for the development of various analytical methods for the examination of electron-ion collision phenomena, including di-electronic recombination. Its use in conjuction with ab initio calculations is shown to be restricted by problems which arise from the presence of long-range non-Coulomb potentials. Empirical fitting to some formulae can be efficient in the use of computer time but extravagant in the use of person time. Calculations at a large number of energy points which make no use of analytical formulae for resonance structures may be made less extravagant in computer time by the development of more efficient asymptotic methods.

50121 (DL/SCI/R—18, pp 8-14) **Collisions and spectroscopy: progress of QDT.** Lu, K.T. (Argonne National Lab., IL (USA)). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

Recent progress of quantum defect theory in electron-ion systems (a) using the semi-empirical approach, (b) by parametrization of physical quantities in terms of quantum defect parameters, (c) with first principle calculations of quantum defect parameters and (d) using generalized QDT, is summarized. The recent development of perturbed Rydberg atoms in the presence of external electric or magnetic fields is also discussed.

50122 (DL/SCI/R—18, pp 15-20) **Application of MQDT to molecular photoionisation and photodissociation.** Jungen, C.; Giusti-Suzor, A. (Centre National de la Recherche Scientifique, 91 - Orsay (France). Lab. de Photophysique Moleculaire). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

The application of molecular quantum defect theory to the molecules H_2 and NO is examined. In these cases the competition between ionisation and dissociation processes has been observed experimentally in detail. It is shown that it is possible to extend MQDT so that it accounts for experimental results.

50123 (DL/SCI/R—18, pp 21-25) **Asymptotic solution of the coupled equations for electron collisions with atoms or positive ions using Dirac hamiltonians.** Grant, I.P. (Oxford Univ. (UK). Dept. of Theoretical Chemistry). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

Possible relativistic effects in low energy electron scattering from atoms or positive ions has been investigated using the Dirac hamiltonian. Single channel formula and many channel expressions indicate that asymptotic estimation of radial wavefunctions can be carried out satisfactorily for most purposes using non-relativistic methods.

50124 (DL/SCI/R—18, pp 26-32) **Review of the theory of electron impact ionisation.** Moores, D.L. (University Coll., London (UK). Dept. of Physics and Astronomy). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

The basic quantum theory of the electron impact ionisation of atomic systems, as developed independently by Peterkop ('Theory of Ionization of Atoms by Electron Impact' Colorado Associated University Press (1977)) and by Rudge and Seaton (Proc. Phys. Soc.; 83:680 (1964) and Proc. Roy. Soc.; A283:262 (1965)) is summarised, and its achievements and limitations discussed. The discussion is chiefly confined to hydrogenic targets.

50125 (DL/SCI/R—18, pp 33-38) **Towards more realistic calculations in electron impact ionisation.** Altick, P.L. (Nevada Univ., Reno (USA). Dept. of Physics). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

Two approaches to coupled channel calculations of electron impact ionization of atoms are described, one based on a variational principle, which requires knowledge of the asymptotic wavefunction and the other based on R-matrix methodology. The distinction between the two approaches lies essentially in the asymptotic region. The advantage of the R-matrix approach is that it relies on known techniques and can be immediately extended to include angular momentum.

50126 (DL/SCI/R—18, pp 39-43) **Electron impact ionization: time-dependent and other numerical approaches.** Bottcher, C. (Oak Ridge National Lab., TN (USA)). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

Methods used to investigate electron impact ionization problems are examined including the wavepacket (time-dependent) method and numerical algorithms. The results of calculations of the ionization of ground and excited states and ionized targets carried out with H(1s), H(2s) and He^+ targets for several impact energies and total angular momenta are reported. Recent advances bearing on the stationary problem are considered.

50127 (DL/SCI/R—18, pp 44-49) **Electron and positron impact ionization threshold laws.** Temkin, A. (National Aeronautics and Space Administration, Greenbelt, MD (USA). Goddard Space Flight Center). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

Theoretical approaches to electron-atom and positron-atom impact ionization threshold law problems are summarized and implications of the results obtained are discussed.

50128 (DL/SCI/R—18, pp 50-56) **Ionisation of atomic hydrogen and helium by fast electrons.** Joachain, C.J. (Brussels Univ. (Belgium). Faculte des Sciences). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

Results are reported of the analysis of the triple differential cross section of the ionization of atomic hydrogen and helium by fast electrons. The (e, 2e) coincidence experiments, in which triple differential cross sections are measured, are classified according to the selected kinematical arrangement and the implications of the arrangements on the theoretical analysis of the collision are examined. The results of a theoretical study of the ionization of atomic hydrogen by fast electrons using the Eikonal-Born series method and calculations of the ionization of helium are examined and compared with recent experimental results.

50129 (DL/SCI/R—18, pp 57-63) **New directions in low energy electron molecule collision calculations.** Burke, P.G.; Noble, C.J. (Science and Engineering Research Council, Daresbury (UK). Daresbury Lab.). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

New theoretical and computational methods for studying low energy electron-molecule collisions are discussed. Having considered the fixed-nuclei approximation and the form of the expansion of the total collision wavefunction, the various approximations which have been made are examined, including the static plus model exchange approximation, the static exchange approximation and the close coupling approximation, particular attention being paid to methods of including the molecular charge polarisation. Various ways which have been developed to solve the resultant equations are discussed and it is found that there is increasing emphasis being given to methods which combine the advantages of discrete multi-centre analytic bases with single centre numerical bases.

50130 (DL/SCI/R—18, pp 64-69) **Recent developments in the theory of electron collisions with polar molecules.** Norcross, D.W. (Joint Inst. for Lab. Astrophysics, Boulder, CO (USA)). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

A review of recent work on the theory of electron collisions with polar molecules is presented under the headings: background, frame transformation methods, approximations to the interaction potential, computational techniques, and applications.

50131 (DL/SCI/R—18, pp 70-77) **Adiabatic analysis of low-energy electron molecule dynamics.** Dourneuf, M. Le; Launay, J.M.; Lan, V.K. (Observatoire de Paris, Section de Meudon, 92 (France). Section d'Astrophysique). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

Considering the kinematics of low energy electron-molecule collisions, it is shown that the light mass of the electron is a key simplifying feature which allows an adiabatic analysis of both the fixed-nuclei low energy scattering process and the resonant coupling to the nuclear motion. Illustrations of this adiabatic formalism are given using N molecules and HCl as examples.

50132 (DL/SCI/R—18, pp 78-80) **Electron-molecule scattering calculations using common features of the R-matrix and variational methods.** Nesbet, R.K. (IBM Research Div., San Jose, CA (USA)). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

Recent developments in computational methods for low energy electron-molecule scattering which combines aspects of the R-matrix and variational methods have been shown to be feasible and capable of being implemented in the context of very large-scale computations.

50133 (DL/SCI/R—18, pp 81-87) **Schwinger and related variational principles in electron-molecule collision processes.** McKoy, V.; Lucchese, R.; Takatsuka, K. (California Inst. of Tech., Pasadena (USA). Arthur A. Noyes Lab. of Chemical Physics). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

An iterative approach to the solution of the Lippmann-Schwinger integral equation for electron-molecule scattering, based on the use of the Schwinger variational principle is outlined. Application of the theory to electron-molecule collisions at the static-exchange level and for use with optical potentials, and a new variational principle for the strong polar molecule case, are discussed. Results of some applications of these methods to a few systems are considered and some results of the use of the method for molecular photoionization are presented. Multichannel extensions of the Schwinger variational principle are discussed and some results as applied to a simple and exactly soluble two-channel model problem presented.

50134 (DL/SCI/R—18, pp 88-92) **Linear algebraic approach to electron-molecule collisions.** Collins, L.A.; Schneider, B.I. (Los Alamos National Lab., NM (USA)). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

The linear algebraic approach to electron-molecule collisions is examined by firstly deriving the general set of coupled integrodifferential equations that describe electron collisional processes and then describing the linear algebraic approach for obtaining a solution to the coupled equations. Application of the linear algebraic method to static-exchange, separable exchange and effective optical potential, is examined.

50135 (DL/SCI/R—18, pp 93-101) **Scattering of charged particles in intense electromagnetic fields.** McDowell, M.R.C. (Royal Holloway Coll., London (UK)). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

The non-relativistic scattering of charged, structureless, spinless particles by a potential in the presence of an intense electromagnetic field, in particular a static magnetic field, is examined in the case where the field quanta are not in resonance with energy levels of the scatterer. The theory is summarized, deficiencies considered and possible observable phenomena are discussed.

50136 (DL/SCI/R—18, pp 102-105) **Electron-atom scattering modified by a resonant laser field.** Mittleman, M.H. (City Coll., New York (USA). Dept. of Physics). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

Laser modified electron-atom scattering, in which the laser is resonant with some transition in the electron-atom system, is discussed under the headings: ground state transition, inter-excited state resonance, inter-resonance resonance, resonantly induced negative ion production and, future work with more intense lasers.

50137 (DL/SCI/R—18, pp 106-110) **Potential scattering of charged particles in the presence of a laser and a static magnetic field.** Zarcone, M. (Royal Holloway Coll., Egham (UK)). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

The problem of the potential scattering of charged particles in the presence of a strong magnetic field and a radiation field (laser) with arbitrary polarisation is considered with special reference to laser polarisation effects.

50138 (DL/SCI/R—18, pp 111-114) **Quadratic Zeeman effect in hydrogen Rydberg series.** Taylor, K.T. (Science and Engineering Research Council, Daresbury (UK). Daresbury Lab.); Clark, C.W. (National Bureau of Standards, Washington, DC (USA). Center for Radiation Research). 1982. NTIS (US Sales Only), PC A06/MF A01. (CONF-820382—).

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

A method of calculating energy levels and wavefunctions for high Rydberg states of a hydrogen atom in a uniform magnetic field of strength 10 - 50 kilogauss, is described. Sturmian functions are employed to represent high Rydberg states of the quadratic Zeeman hamiltonian. Some oscillator strength transitions from the ground state of atomic hydrogen to states with magnetic quantum number $m = 1$ are given as an example of the calculations. Rydberg states in cesium have also been investigated by the method.

50139 **(DL/SCI/R—18) Recent developments in electron-atom and electron-molecule collision processes. Proceedings of the Daresbury Study Weekend, 26-27 March, 1982.** Eissner, W. (comp.). (Science and Engineering Research Council, Daresbury (UK). Daresbury Lab.). 1982. 125p. (CONF-820382—). NTIS (US Sales Only), PC A06/MF A01. Order Number DE83781072.

From Conference on recent developments in electron-atom and electron-molecule collision processes; Warrington, UK (26 Mar 1982).

Abstracts of individual items from the meeting were prepared separately for the data base. (GHT)

50140 **(DOE/ER/01116—36) Kinetics of growth and decay of excited rare-gas atoms and molecules in the pulse radiolysis of pure rare gases and of mixtures of rare gases with molecular quenching agents.** Firestone, R.F. (Ohio State Univ., Columbus (USA). Dept. of Chemistry). 15 Jul 1983. Contract AC02-76ER01116. 19p. NTIS, PC A02/MF A01. Order Number DE83017016.

The temporal behavior of vibrationally relaxed first triplet Kr_2 in the presence of N_2 has been examined, and the rate constant for destructive quenching by N_2 has been evaluated at 298K. Its value is of the same order of magnitude as that for quenching of first triplet Ar_2, but is somewhat smaller. This suggests that the krypton and argon excimers excite different electronic states of N_2, the former leading to $N_2(A)$ and $N_2(B)$ and the latter principally to $N_2(C)$, in accord with the general rule that near-resonant energy transfer tends to be favored over events which form products bearing significant translational energy. A new value for the spontaneous radiative decay constant of vibrationally relaxed first triplet Kr_2 has also been determined. A generalized mechanism for decay of Paschen(ls) atoms and for concomitant growth and decay of bound-state excimer molecules has been developed. Modelling calculations have shown that decay constants for $Ar(^3P_2)$ measured at low (1 to 20 torr) and high (100 to 700 torr) pressures are not discrepant with respect to one another and can be precisely fitted with the generalized mechanism. Implications regarding the temporal behavior of vibrationally relaxed Ed_2 excimers are also discussed. Data obtained by single frequency laser probe monitoring of $Ar(^3P_2)$ suggests that, although the ls-2p absorption lines are of Lorentzian form at 700 torr, as expected, the apparent line width narrows with increasing time. The cause of this phenomenon has not yet been identified.

50141 **(DOE/ER/10749—2) Theoretical study of electron capture in ion-ion and ion-atom collisions. Progress report, September 1, 1982-July 31, 1983.** Lieber, M.; Chan, F.T. (Arkansas Univ., Fayetteville (USA). Dept. of Physics). Jul 1983. Contract AS05-80ER10749. 5p. NTIS, PC A02/MF A01. Order Number DE83016435.

The work begun by Eichler and Chan, and continued by Chan, Lieber and co-workers, has demonstrated the utility of the eikonal approximation for calculating electron capture cross sections in energetic ion-atom collisions. In the past year this research has been fruitfully applied and extended in several areas and has resulted in four papers submitted.

50142 (IA—1375, pp 7-8) **New method for calculating transition probabilities for reactive collisions.** Shima, Y.; Baer, M. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

50143 (IA—1375, pp 81-82) **Rotation-libration transition in molecular ortho-D_2 under pressure.** Aviram, I.; Goshen, S.; Thieberger, R. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

50144 (IA—1375, pp 123-124) **Study of molecular orientation using nuclear techniques.** Moreh, R.; Shahal, O. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

50145 **(INDC(NDS)—137/GA) What we do and not know about electron impact excitation of atomic hydrogen.** Callaway, J.; McDowell, M.R.C. (International Atomic Energy Agency, Vienna (Austria). International Nuclear Data Committee). Nov 1982. 17p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702509.

The present state of knowledge derived from both theoretical and experimental information on electron impact excitation of atomic hydrogen is briefly reviewed. Suggestions are made for further calculations and for additional experiments.

50146 (INIS-mf—8022, pp p.70-84) **Program for the calculation of the semiempirical radial wave functions by means of the variable Tomas-Fermi potential and for the determination of the radial integrals of the dipole transitions.** Kuzmitskite, L.L. 1980. (In Russian). NTIS (US Sales Only), PC A05/MF A01.

In Calculation programmes for the characteristics of the electron transitions. Issue 8. A collection of programmes on the software of atomic calculations.

The program is meant for the determination of the semiempirical radial wave functions of the positive ions and the calculation of the radial integrals of the dipole transition. The semiempirical wave functions are calculated using Tomas-Fermi potential with the variable parameter, which provides for the coincidence of the energy obtained with the ionization energy of the state under consideration. The program is written in the FORTRAN language for the BESM-6 computer.

50147 **(INIS-SU—135) Proceedings of the 7. International conference on atomic collisions in solids. Volume 2.** (Moskovskij Gosudarstvennyj Univ. (USSR)). 1980. Vp. (CONF-770931—Vol.2). NTIS (US Sales Only), PC A16/MF A01. Order Number DE83780873.

From 7. international conference on atomic collisions in solids; Moscow, F.R. Germany (19 Sep 1977).

Abstracts of individual itmes from the conference were prepared separately for the data base. (GHT)

50148 **(IS-T—1051) Theory and application of collision integrals for rigid ovaloids.** Cole, R.G. (Ames Lab., IA (USA)). Jun 1983. Contract W-7405-ENG-82. 237p. NTIS, PC A11/MF A01. Order Number DE83016413.

Thesis.

A derivation of the classical Enskog and Boltzmann equations appropriate to rigid ovaloids is given. The Chapman-Enskog method for obtaining solutions to these equations is outlined. Gas phase studies of (1) Senftleben-Beenakker effects in simple systems composed of symmetric top molecules, and (2) chiral molecules in the presence of an external magnetic field are carried out. Also, results of liquid phase studies of (1) orientational relaxation phenomena in atom-diatom fluids, and (2) shear-orientational couplings in simple diatomic fluids, as measured by the Rytov parameter obtained from Depolarized Light Scattering, are reported. Finally, the pseudo-Liouville formalism is generalized to rigid ovaloids. This formalism is then utilized for the analysis of the effects of chattering on the Boltzmann bracket integral for rigid ovaloids.

50149 **(ITEP—79(1982)) Hydrogen atom in external fields. Arbitrary constant magnetic field (the Zeeman effect).** Turbiner, A.V. (Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Moscow. Inst. Teoreticheskoj i Ehksperimental'noj Fiziki). 1982. 40p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702493.

A quantative analysis of two sets of excited states of hydrogen atom in an arbitrary constant magnetic field is carried out for the first time. A "non-linearization" method was used. Perturbational terms up to $kappa^6$ are calculated. It is shown that the domain of applicability of the perturbation theory is contracted sharply with increase in the atom excitation degree. The range of this domain is estimated. Functional structure of arbitrary correction to the wave function is investigated. The perturbation theory in the fields is considered for the hydrogen atom constant electric (epsilon) and magnetic fields; the coefficients at the crossing terms $epsilon^2 kappa^2$ and $apsion^2 kappa^4$ are calculated for the first time. It was found that the coefficients are abnormally large, as compared with other coefficients of the same order ($epsilon^4$, $kappa^4$, $epsilon^6$, $kappa^6$).

50150 **(JINR—R-4-82-267) Lifetime of the dtsub(μ) mesomolecule.** Bogdanova, L.N.; Markushin, V.E.; Melezhik, V.S.; Ponomarev, L.I. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics). 1982. 12p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702510.

The dsub(μ) mesic molecule deexcitation cascade with account of nuclear absorption is considered and the lifetime tausub(m) of the mesic molecule (the corresponding muon decay probability for the ωsub(m) cascade) is calculated. The ωsub(m) value knowledge is required for the detailed description of muon catalysis process kinetics. The performed investigation shows that at liquid hydrogen density in the D_2+T_2 mixture lifetime of dtsub(μ) mesic molecules tausub(m) approximately 10^{-11} s (just as the cascade time in dsub(μ)- and tsub(μ) atoms tausub(a) < $2x10^{-11}$ c) is negligibly small as compared wuth the tausub(dt) and tausub(dtμ) times of the dsub(μ) → tsub(μ) isotopic exchange and dtμ - molecules production. When considering the kinetics of the μ catalysis processes in the D_2+T_2 mixture of the ωsub(α)+ωsub(m) < or approximately $1.5x10^{-5}$ probability of muon decay for the time of mesic atom and mesomolecule cascades may be neglected as compared with the ωsub(s)=0.Nx10^{-2} probability of "catalyst poisoning".

50151 (KU-HCOE-FL2-R—82-05) Sputtering on cobalt with noble gas ions. Sarholt-Kristensen, L.; Johansen, A.; Johnson, E.; Chernysh, V.S. (Copenhagen Univ. (Denmark). H.C. Oersted Inst.). 1982. 21p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702258.

Single crystals of cobalt have been bombarded with 80 keV Ar^+ ions and with 80 keV and 200 keV Xe^+ ions in the <0001> direction of the hcp phase and the <111> direction of the fcc phase. The sputtering yield has been measured as function of target temperature (20°C-500°C), showing a reduction in sputtering yield for 80 keV Ar^+ ions and 200 keV Xe^+ ions, when the crystal structure changes from hcp to fcc. In contra-distinction to this, bombardment with 80 keV Xe^+ ions results in an increase in sputtering yield as the phase transition is passed. Sputtering yields for <111> nickel are in agreement with the sputtering yields for fcc cobalt indicating normal behaviour of the fcc cobalt phase. The higher sputtering yield of <0001> cobalt for certain combinations of ion mass and energy may then be ascribed to disorder induced partly by martensitic phase transformation, parlty by radiation damage.

50152 (LBL—15855) Molecular-beam scattering. Vernon, M.F. (Lawrence Berkeley Lab., CA (USA)). Jul 1983. Contract AC03-76SF00098. 389p. NTIS, PC A17/MF A01. Order Number DE83016138.

Portions are illegible in microfiche products; Thesis.

The molecular-beam technique has been used in three different experimental arrangements to study a wide range of interatomic and molecular forces. Chapter 1 reports results of a low-energy (0.2 kcal/mole) elastic-scattering study of the He-Ar pair potential. The purpose of the study was to accurately characterize the shape of the potential in the well region, by scattering slow He atoms produced by expanding a mixture of He in N_2 from a cooled nozzle. Chapter 2 contains measurements of the vibrational predissociation spectra and product translational energy for clusters of water, benzene, and ammonia. The experiments show that most of the product energy remains in the internal molecular motions. Chapter 3 presents measurements of the reaction Na + HCl → NaCl + H at collision energies of 5.38 and 19.4 kcal/mole. This is the first study to resolve both scattering angle and velocity for the reaction of a short lived (16 nsec) electronic excited state. Descriptions are given of computer programs written to analyze molecular-beam expansions to extract information characterizing their velocity distributions, and to calculate accurate laboratory elastic-scattering differential cross sections accounting for the finite apparatus resolution. Experimental results which attempted to determine the efficiency of optically pumping the Li(2^2P/sub 3/2/) and Na(3^2P/sub 3/2/) excited states are given. A simple three-level model for predicting the steady-state fraction of atoms in the excited state is included.

50153 (LBL—16327) High-charge-state ion sources. Clark, D.J. (Lawrence Berkeley Lab., CA (USA)). Jun 1983. Contract AC03-76SF00098. 16p. (CONF-830920—7). NTIS, PC A02/MF A01. Order Number DE83016620.

From 7. symposium on sources and ion assisted technology and 4. international conference on ion and plasma assisted techniques; Kyoto, Japan (12 Sep 1983).

Portions are illegible in microfiche products.

Sources of high charge state positive ions have uses in a variety of research fields. For heavy ion particle accelerators higher charge state particles give greater acceleration per gap and greater bending strength in a magnet. Thus higher energies can be obtained from circular accelerators of a given size, and linear accelerators can be designed with higher energy gain per length using higher charge state ions. In atomic physics the many atomic transitions in highly charged ions supplies a wealth of spectroscopy data. High charge state ion beams are also used for charge exchange and crossed beam experiments. High charge state ion sources are reviewed. (WHK)

50154 (UWThPh—81-26) Number of unnatural parity bound states of the H^- -ion. Grosse, H.; Pittner, L. (Vienna Univ. (Austria)). 1981. 18p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702249.

We show rigorously that the H^- -ion possesses exactly one (three times degenerate) bound state in the unnatural parity sector.

50155 Laser optical pumping of a nuclear excited state: $^{134}Ba(10^+)$. Niv, Y. (Rutgers Univ., Piscataway, NJ); Bell, C.; Myers, E.; Raghaven, P.; Pappas, P.G.; Thomas, J.; Murnick, D.E. *Nuclear Science Research Conference Series;* 3: 163-170(1982). (CONF-820428—).

From Conference on lasers in nuclear physics; Oak Ridge, TN, USA (21 Apr 1982).

An experiment is underway at the Rutgers-Bell Tandem Van de Graaff accelerator to measure the isomer shift of a nuclear excited state in ^{134}Ba(I/sub π/ = 10^+, E/sub x/ = 2.96 MeV, T/sub 1/2/ = 2.63 μs) using the laser induced nuclear orientation technique.

50156 HVEM-ion-beam interface system at the Argonne National Laboratory. Taylor, A.; Philippides, A.; Ryan, E.A.; Wallace, J.R.; Wrobel, J.R. (Argonne National Lab., IL (USA)). pp 26-29 of High voltage. Proceedings of EUREM 80. Brederoo, P.; van Landuyt, J. (eds.). Leiden, Netherlands; Seventh European Congress on Electron Microscopy Foundation (1980). (CONF-800821—).

From 7. European electron microscopy congress and the international x-ray optics and microanalysis conference; Hague, Netherlands (24 Aug 1980).

The HVEM-Tandem Facility at the ANL-Materials Science Division is outlined and illustrated. It provides unique combinations of the techniques of high voltage electron microscopy, ion implantation/bombardment, and ion-beam analyses. This national facility for in-situ ion implantation/bombardment in the HVEM grew out of radiation effects studies at ANL and the recent uses of implantation in surface metallurgy. In particular, because foils 1-5 μm can be inspected in the HVEM, in-situ study of bulk high temperature behavior becomes feasible. The 10 KeV-8 MeV span of energies available from two ion accelerators provides ion ranges that are comparable with or exceed these foil thickness for a substantial number of elements in the periodic table. The ion-beam interface is an instrumented beam transport system that delivers ions from the accelerators into the HVEM column.

50157 Analysis. Proceedings of EUREM 80. Brederoo, P.; Cosslett, V.E. (eds.). Leiden, Netherlands; Seventh European Congress on Electron Microscopy Foundation (1980). vp. (CONF-800821—).

From 7. European electron microscopy congress and the international x-ray optics and microanalysis conference; Hague, Netherlands (24 Aug 1980).

Abstracts of individual items from the meeting were prepared separately for the data base. (GHT)

6404 Fluid Physics

REFER ALSO TO CITATION(S) 49641

50158 (DOE/ER/10559—T1) Topics in physico-chemical hydrodynamics. Progress report. Levich, B. (City Coll., New York (USA). Inst. of Applied Chemical Physics). [nd]. Contract AC02-80ER10559. 21p. NTIS, PC A02/MF A01. Order Number DE83015894.

Research on interfacial mechanics is reported under the following headings: Van der Waals instabilities in ultrathin viscoelastic films, surface reaction induced Marangoni instabilities on the surface of a fluid thin film, the spreading of a monolayer on the clean surface of a deep liquid, propagation of hydrodynamic Marangoni waves on the surface of a thin fluid film driven by a surface chemical reaction, and multiscale expansion solutions of the motion of a contact line. Also progress on the development of the theory of homogeneous turbulence is reported. (WHK)

50159 **Numerical solution of nonlinear partial differential equations of mixed type.** Jameson, A. (Courant Inst. of Mathematical Sciences, New York, NY). pp 275-320 of Numerical solution of partial differential equations-III, SYNSPADE 1975. Hubbard, B. (ed.). New York, NY; Academic Press Inc. (1976). (CONF-750545—). Contract AC02-76ER03077.

From Symposium on the numerical solution of partial differential equations; College Park, MD, USA (19 May 1975).

Some recently developed numerical methods for the solution of nonlinear equations of mixed type are reviewed. These methods have been used to calculate transonic flows with shock waves, and the discussion is restricted to this topic. (GHT)

6451 Particle Interactions And Properties - Experimental

REFER ALSO TO CITATION(S) 49656, 50260

50160 **(BNL—33384) Glueballs in the reaction $\pi p p \rightarrow$ phi phi n.** Etkin, A.; Foley, K.J.; Longacre, R.S. (Brookhaven National Lab., Upton, NY (USA); City Coll., New York (USA)). 1983. Contract AC02-76CH00016;AC02-79ER10550. 3p. (CONF-830718—2). NTIS, PC A02/MF A01. Order Number DE83015794.

From International Europhysics conference on high energy physics; Brighton, UK (20 Jul 1983).

The BNL/CCNY collaboration has increased the statistics on the reaction 22 GeV/c $\pi^- p \rightarrow$ phi phi n from 1203 to $\simeq$ 4000 events. A preliminary partial wave analysis yields three states, all with J/sup PC/ = $2+^+$, which we conclude are produced by glueballs. Previously we had two such states, both with J/sup PC/ = 2^{++}. The data analysis, and the QCD arguments for these states being produced by glueballs will be presented and discussed.

50161 **(DOE/ER/04043—T3) Search for admixture of massive neutrinos in the decay, $\pi \rightarrow \mu$ nu.** Minehart, R.C.; Ziock, K.O.H.; Marshall, R.; Stephens, W.A.; Daum, M.; Jost, B.; Kettle, P.R. (Virginia Univ., Charlottesville (USA). Dept. of Physics; Schweizerisches Inst. fuer Nuklearforschung, Villigen). 1981. Contract AS05-76ER04043. 23p. NTIS, PC A02/MF A01. Order Number DE83016512.

Portions are illegible in microfiche products.

In recent years interest in the question of whether neutrinos are truly massless has been rekindled, both by the development of a theory to unify the weak and electromagnetic interactions and by experimental observations. Some models based on the unified theory support the existence of neutrino mass. Direct measurement of the electron neutrino mass has resulted in an, as yet unconfirmed, value of 14 to 16 eV/c^2. A measurement of the muon neutrino mass set an upper limit of 0.5 MeV/c^2. An indirect argument for neutrino mass arises from the experimental observation of Davis et al., that there are too few electron neutrinos reaching the earth from the sun. This might be explained by invoking a neutrino oscillation process, which requires that neutrinos have mass. Terrestrial searches for neutrino oscillation have so far been inconclusive. An experiment to measure the muon energy for determining the neutrino mass in the pion decay $\pi^{-+} \rightarrow \mu^{-+}$ + anti nu/sub μ/ is described. We have developed a system for stopping the pions in a high purity (intrinsic), totally depleted, Germanium detector. With this apparatus we were able to measure the muon energy with a resolution of 7 keV, corresponding to a mass resolution of Δm/sub nu/ $\sim$ 2 MeV/c^2. Results are presented. (WHK)

50162 **(DOE/ER/40033—47) Comparison between p anti p and pp interactions at the ISR for high p/sub T/ and E/sub T/^{0} spectra.** von Gagern, C. (Rockefeller Univ., New York (USA)). 25 Apr 1983. Contract AC02-81ER40033. 9p. (CONF-830140—4). NTIS, PC A02/MF A01. Order Number DE83016553.

From 18. Rencontre de Moriond conference; La Plagne, France (23 Jan 1983).

In December 1982 much more p anti p data at $\sqrt{s}$ = 53 GeV were accumulated at the CERN ISR than during the run in October 1981. Preliminary results are presented both for a single particle trigger and for a total electromagnetic energy trigger. No significant differences between p anti p and pp interactions were observed.

50163 **(DOE/ER/40033—48) Study of high-mass e^+e^- pairs at the CERN ISR.** Angelis, A.L.S.; Basini, G.; Besch, H.J. (Rockefeller Univ., New York (USA); Oxford Univ. (UK); European Organization for Nuclear Research, Geneva (Switzerland); Michigan State Univ., East Lansing (USA)). Jul 1983. Contract AC02-81ER40033. 11p. (CONF-830718—3). NTIS, PC A02/MF A01. Order Number DE83016555.

From International Europhysics conference on high energy physics; Brighton, UK (20 Jul 1983).

A sample of e^+e^- events produced in pp interactions at a center of mass energy $\sqrt{s}$ = 63 GeV and with invarient mass m/sub ee/ > 11 GeV/c^2 is discussed. The cross sections $d^2\sigma$/dmdy at y = 0, and d σ/dp/sub T/ are presented and the mean transverse momentum, p/sub T/, of the pairs is found to be 2.3 +- 0.4 GeV/c. Azimuthal correlations between the e^+e^- pair and the associated particles are observed.

50164 **(DOE/ER/40085—3) High-energy physics at Tufts University. Progress report, August 1, 1982-July 31, 1983.** (Tufts Univ., Medford, MA (USA). Dept. of Physics). 1983. Contract AC02-83ER40085. 107p. NTIS, PC A06/MF A01. Order Number DE83016570.

Progress on the following topics is described: neutrino-deuterium interactions; anti pN interactions; K/sub s/^{0}/K/sub s/^{0} $\pi^- p$ interactions at 300 GeV/c; phi phi final states in 400 GeV/c pp; Fermilab Tevatron MPS proposals; nu D-physics proposed using HBC with internal calorimeter; Talloires neutrino workshop; photoproduction of charmed particles; streamer chamber study of anti K^{*0}(890); Soudan-II nucleon decay program; CCD-detector study; optical resolution study; measuring hardware systems and data links; hadronic production of chi mesons; high-p/sub t/ inelastic hadronic reactions; and theoretical investigations. (WHK)

50165 **(IFVE-OEIPK—82-156) Study of interference correlations between likely-charged pions in anti pp interactions at 32 GeV/c.** Babintsev, V.V.; Bogolyubskij, M.Yu.; Borovikov, A.A. (Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Serpukhov. Inst. Fiziki Vysokikh Ehnergij). 1982. 11p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703410.

Short-range interference correlations are observed between likely-charged pions in anti pp interactions at 32 GeV/c. The dimension of the pion emission region is estimated in the framework of the KOPYLOV-PODGORETSKY formalism and found to be of the order of 2 Fm. This value is compatible with the corresponding ones obtained for other hadron interactions. No significant difference is found for the longitudinal and transverse pion emission ranges. The value of contribution of noncoherent emitted pions is identical for anti pp and K^-p interactions.

50166 **(JINR—1-82-778) Comparison of diffraction dissociation of antiprotons with inelastic anti pp interactions and e^+e^- annihilation into hadrons.** Batyunya, B.V.; Bogulavskij, I.V.; Vrba, V. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy). 1982. 5p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703411.

The comparison of experimental multiplicity distributions for the processes of inelastic anti pp interaction and antiproton diffrac-

tion dissociation at 22.4 GeV/c with leading particles removed from event with e^+e^- annihilation into hadron is presented. The observed similarity of these processes corresponds to the dual parton model predictions.

50167 (JINR—D-1-82-116) Observation of a narrow baryon resonance decaying into Σp(1385) and K⁺. Aleev, A.N.; Aref'ev, V.A.; Balandin, V.P. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy). 1982. 7p. (In Russian). (CONF-820718—35). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702292.

From 21. international conference on high energy physics; Paris, France (29 Jul 1982).

In the cource of the experiment performed in a neutron beam at approximately 40 GeV/c of the Serpukhov accelerator using the BIS-2 spectrometer, in the reaction $n+C \rightarrow \Lambda^0 h^-h^+ + ... \Lambda^0 \rightarrow p\pi^-$ the production of the narrow baryon resonance with mass about 1.95 GeV/c^2, decaying into $\Sigma^-(1385)+K^+$ with subsequent decay $\Sigma^-(1385) \rightarrow \Lambda^0\pi^-$ has been observed. With the purpose of optimum isolation of $\Lambda^0 \rightarrow p\pi^-$ and $\Sigma^-(1385) \rightarrow \Lambda^0\pi^-$ decays geometric and kinematic characteristics of the studied events are investigated. The distribution of a number of events depending on invariant mass M of the $(p\pi^-)$, $(\Lambda^0\pi^-)$, $(\Lambda^0\pi^-K^+)$ system is shown. The existence of the resonance an evidence of which has been obtained earlier is confirmed. It is obtained that the mass and width of the resonance observed are equal: M=1.955+0.02-0.01 GeV/c^2; GITA < or approximately 0.035 GeV/c^2. The observed resonance may be interpreted as a five-quark baryon state.

50168 (JINR—E-1-82-446) Multiquark resonant states. Shahbazian, B.A. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy). 1982. 14p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703412.

The invariant mass spectra of forty nine hadronic systems with hypercharge, strangeness and baryon number, varied in wide limits have been studied. Resonance peaks have been found in the invariant mass spectra of Y <= 1 systems only. Canditates for six-quark dibaryons should be considered Λp 2183, 2255, 2354 MeV/c^2 and Λpπ 2495 MeV/c^2 resonant states. Three more candidates for anti qq^4 states were found $\Lambda\pi^+\pi^+$: 1705, 2072, 2605 MeV/c^2. The masses of all these candidates are in good agreement with Bag Model predictions. A hypercharge selection rule is suggested: "The hypercharge of hadronic resonances in weak gravitational fields cannot exceed one Y <= 1.

50169 (JINR-R—1-82-360) Polarization of Λ0 produced by neutrons with energy of about 40 GeV on carbon nuclei. Aleev, A.N.; Aref'ev, V.A.; Balandin, V.P. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy). 1982. 12p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703413.

The Λ^0 polarization was measured in the transverse momenta Psub(T) range between 0 and 1.2 GeV/c. Λ^0 were produced inclusively by neutrons or carbon nuclei at a mean energy of about 40 GeV. The polarization increases with Psub(T) and reaches about 30% at Psub(T)=0.8 GeV/c. Mean value of the Λ^0 longitudinal asymmetry relative to a momentum vector in the laboratory system agrees with a zero one and is equal to 0.003+-0.033.

50170 (LBL—16116) Charged-hadron production in e^+e^- collisions at PEP with the TPC. Hadley, N.J. (Lawrence Berkeley Lab., CA (USA)). 13 May 1983. Contract AC03-76SF00098. 144p. NTIS, PC A07/MF A01. Order Number DE83015944.

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We have studied hadron production in e^+e^- annihilation at 29 GeV center of mass energy. We have measured the particle fractions and particle separated differential cross sections using the PEP-4 (Time Projection Chamber) detector. The particles were identified by measuring their ionization energy loss (dE/dx). The pion fraction decreases from above 90% at 400 MeV/c to 55% at 6 GeV/c. Our results for kaon production require that a large number of kaons are produced by strange quarks pulled from the vacuum. We have also measured R, the ratio of the total hadronic cross section to the mu pair cross section. Our value for R is 3.7 with an uncertainty of 10%. This value is in agreement with the results of other experiments and with the predictions of the quark-parton model.

50171 (LBL—16146) Review of PEP experiments. Goldhaber, G. (Lawrence Berkeley Lab., CA (USA)). Mar 1983. Contract AC03-76SF00098. 42p. (CONF-830377—2). NTIS, PC A03/MF A01. Order Number DE83016106.

From 18. Rencontre de Moriond conference; LaPlagne, France (19 Mar 1983).

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Recent physics results from four PEP experiments: Mark II, MAC, DELCO, and TPC are presented herewith. The topics discussed deal with flavor tagging of charmed and bottom quarks, tau and D^0 lifetimes, Electroweak interference effects, searches for new particles and dE/dx measurements.

50172 (RL—82-090) Weak decays of new particles. Kalmus, G. (Science Research Council, Chilton (UK). Rutherford and Appleton Labs.). Oct 1982. 39p. (CONF-820718—45). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83703414.

From 21. international conference on high energy physics; Paris, France (29 Jul 1982).

The present experimental situation in tau-lepton, B-meson and charmed particle decays is reviewed. Special attention is paid to new lifetime measurements and in the case of B-meson decays to the rate of b → u compared to b → c. Results are compared with theoretical expectations.

50173 (SLAC-PUB—3120) Physics with polarized beams in e+e⁻ colliders. Prescott, C.Y. (Stanford Linear Accelerator Center, CA (USA)). May 1983. Contract AC03-76SF00515. 7p. (CONF-830231—4). NTIS, PC A02/MF A01. Order Number DE83016441.

From Europhysics study conference on electroweak effects at high energies; Erice, Italy (1 Feb 1983).

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The spin structure of the standard model of electroweak interactions is described, with emphasis on the relevance to polarized beam phenomena. The polarization dependence of the cross section, charge asymmetries, and examples of experimental measurements using longitudinal polarization are given. Longitudinal beam polarization is discussed in some detail, including electroweak radiative corrections. Applications to testing the standard model and looking beyond for additional gauge bosons are considered.

50174 (SLAC-TN—83-6) Introduction to high-energy physics and the Stanford Linear Accelerator Center (SLAC). Clearwater, S. (Stanford Linear Accelerator Center, CA (USA)). Mar 1983. Contract AC03-76SF00515. 12p. NTIS, PC A02/MF A01. Order Number DE83015988.

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The type of research done at SLAC is called High Energy Physics, or Particle Physics. This is basic research in the study of fundamental particles and their interactions. Basic research is research for the sake of learning something. Any practical application cannot be predicted, the understanding is the end in itself. Interactions are how particles behave toward one another, for example some particles attract one another while others repel and still others ignore each other. Interactions of elementary particles are studied to reveal the underlying structure of the universe.

50175 (UWThPh—82-22) Production of single W bosons in e⁺ e⁻ and e⁻ p collisions. Neufeld, H. (Vienna Univ. (Austria)). 1982. 16p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702278.

The production of W bosons in electron-positron colliding beams below the W^+W^- threshold is discussed. The corresponding reactions $e^+ e^- \rightarrow l^{+-} W^{-+} sup((-))vsub(l)$ yield total cross-sections of the order of 10^{-37} cm^2 (for l = e) and 10^{-38} cm^2 (for l = μ). The total cross-sections as well as the angular and energy distributions of the W boson in $e^+e^- \rightarrow e^{+-} W^{-+} sup((-))vsub(e)$ are sensitive to the magnetic moment of the W. So, with this reaction, not only W bosons can be produced but also the gauge nature of the

interaction can be tested. The decay $Z^0 \rightarrow l^{+-} W^{-+}$ sup((-))νsub(l) is discussed in view of its observation in $e^+ e^-$ experiments. Finally the cross-sections of $e^- p \rightarrow$ νsub(e)$W^- X^+$ are computed. They are of the order of 10^{-38} cm² for √s as appropriate 200 GeV.

6452 Particle Interactions And Properties - Theoretical

REFER ALSO TO CITATION(S) 50229, 50231, 50235, 50240

50176 (BNL—33415) Proton decay theory. Marciano, W.J. (Brookhaven National Lab., Upton, NY (USA)). 1983. Contract AC02-76CH00016. 8p. (CONF-8304112—2). NTIS, PC A02/MF A01. Order Number DE83016438.

From 4. workshop on grand unification; Philadelphia, PA, USA (21 Apr 1983).

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Topics include minimal SU(5) predictions, gauge boson mediated proton decay, uncertainties in tau/sub p/, Higgs scalar effects, proton decay via Higgs scalars, supersymmetric SU(5), dimension 5 operators and proton decay, and Higgs scalars and proton decay. (WHK)

50177 (BNL—33502) Nucleon-antinucleon interaction. Dover, C.B. (Brookhaven National Lab., Upton, NY (USA)). 1983. Contract AC02-76CH00016. 22p. (CONF-830862—6). NTIS, PC A02/MF A01. Order Number DE83016698.

From 10. international conference on few-body problems in physics; Karlsruhe, F.R. Germany (21 Aug 1983).

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The current status of our understanding of the low energy nucleon-antinucleon (N anti N) interaction is reviewed. We compare several phenomenological models which fit the available N anti N cross section data. The more realistic of these models employ an annihilation potential W(r) which is spin, isospin and energy dependent. The microscopic origins for these dependences are discussed in terms of quark rearrangement and annihilation processes. It is argued that the study of N anti N annihilation offers a powerful means of studying quark dynamics at short distances. We also discuss how one may try to isolate coherent meson exchange contributions to the medium and long range part of the N anti N potential. These pieces of the N anti N interaction are calculable via the G-parity transformation from a model for the NN potential; their effects are predicted to be seen in N anti N spin observables, to be measured at LEAR. The possible existence of quasistable bound states or resonances of the anti N plus one or more nucleons is discussed, with emphasis on few-body systems. 42 references.

50178 (DOE/ER/01545—330) Gauge boson masses and lepton mixing in 0(4) x U(1) gauge model. Tanaka, K. (Ohio State Univ., Columbus (USA). Dept. of Physics). 1983. Contract AC02-76ER01545. 7p. NTIS, PC A02/MF A01. Order Number DE83016558.

The Cabibbo angle is introduced as a mixing angle of the gauge bosons W/sup +-/ and X/sup +-/ in an 0(4) x U(1) gauge model. Masses of gauge bosons are calculated to be M/sub W/ = 82 (input), M/sub Z/ = √2 M/sub W/ sec γ = 130 (γ is mixing angle, $\sin^2 \gamma = 0.21$), M/sub X/ = 666, and M/sub Y/ = 660, in units GeV. The W/sub μ/sup +-/ and Z/sub μ/⁰ couple to the familiar charged and neutral currents, respectively. The effective neutrino oscillation angle is found to be the Cabibbo angle.

50179 (DOE/ER/10448—1) Research in theoretical physics. van Dam, H. (North Carolina Univ., Chapel Hill (USA). Dept. of Physics and Astronomy). 1983. Contract AS05-79ER10448. 14p. NTIS, PC A02/MF A01. Order Number DE83016222.

Topics include massive neutrinos, the invisible axion, global supersymmetry in grand unification, Kaluza-Klein anomalies, theory of gravity, quarkonium hyperfine splittings and the QCD scale parameter, a supersymmetric preon model, quantum mechanics of an extended object, E(6) theory without domain walls, and tensor methods for E(6). (WHK)

50180 (DOE/ER/40008—35) Axions in cosmology. Sikivie, P. (Florida Univ., Gainesville (USA). Dept. of Physics). 1982. Contract AS05-81ER40008. 52p. (CONF-820283—1). NTIS, PC A03/MF A01. Order Number DE83015590.

From 21. Schladming winter school; Paris, France (1 Feb 1982).

Topics include the strong CP problem, the Peccei-Quinn mechanism and the axion, the vacuum structure of axion models and the period of θ, domain walls, solutions to and constraints from the domain wall problem, how many axions in the universe, and axions and galaxies. 48 references. (WHK)

50181 (DOE/ER/40048—12-N3) Recoil corrections in bag models. Goldflam, R.; Betz, M. (Washington Univ., Seattle (USA)). Jun 1983. Contract AC06-81ER40048. 5p. (CONF-830862—4). NTIS, PC A02/MF A01. Order Number DE83015897.

From 10. international conference on few-body problems in physics; Karlsruhe, F.R. Germany (21 Aug 1983).

In spite of their success in describing hadron mass spectra, bag models have been largely unsuccessful in explaining bag dynamics. In particular, bag models have failed to provide an insight into the quark effects in nucleon-nucleon interaction, nuclear structure, etc. This appears to be largely due to the lack of an explicit mechanism for bag formation in the MIT-type picture. Some of these questions appear soluble, provided the bag is generated dynamically as in the soliton bag model. Related questions, as e.g. the Goldstone mechanism for the pion, appear more fundamental and are not likely to be resolved within the framework of bag models. Another problem, which is not yet completely solved, is the dynamics of bag interaction with an external probe, e.g. a photon. An understanding of such interaction is necessary in order to calculate hadronic form factors, magnetic moments and other bag properties. Equations for the recoil corrected magnetic moment and the charge radius of the proton are given; and calculations of the recoil corrected electric, magnetic and axial form factors of the nucleon are discussed. (WHK)

50182 (DOE/ER/70004—342) Charm production in the valon model. Hwa, R.C. (Oregon Univ., Eugene (USA)). Jan 1982. Contract AT06-76ER70004. 11p. NTIS, PC A02/MF A01. Order Number DE83015909.

The valon model for hadron structure is extended to include charm quarks in the sea. The resultant charm distribution is then used in the recombination model to determine the inclusive distributions of charm particles produced in hadronic collisions at low p/sub T/. Predictions agree well with experiment.

50183 (DOE/ER/70004—343) Connection between QCD and Regge intercept. Hwa, R.C. (Oregon Univ., Eugene (USA)). Jun 1982. Contract AT06-76ER70004. 13p. NTIS, PC A02/MF A01. Order Number DE83015908.

It is shown that QCD puts constraints on the value of the zero intercept of the leading non-Pomeron Regge trajectory. The inputs of our analysis are the valon model of hadrons, some phenomenological properties of structure functions, and perturbative QCD. The result is α/sub rho/(0) = 0.40 +- 0.04.

50184 (DOE/ER/70004—344) Recent developments in the valon model. Hwa, R.C. (Oregon Univ., Eugene (USA)). Jul 1982. Contract AT06-76ER70004. 18p. NTIS, PC A02/MF A01. Order Number DE83015907.

Developments in four directions in the valon model for hadron structure and interactions are reviewed. They are: (1) target fragmentation in deep inelastic scattering, (2) valon size, (3) connection between QCD and Regge behavior, and (4) kaon structure. These developments supplement what have already been found about the valon model as a useful framework to describe the hadrons in hard as well as soft processes.

50185 **(IFVE-OTF—82-39) Infinite set of integrals of motion for a closed supersymmetric string.** Borodulin, V.I.; Isaev, A.P. (Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Serpukhov. Inst. Fiziki Vysokikh Ehnergij). 1982. 10p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702488.

Using the collective coordinate method a complete system of values commutating with a total momentum is constructed for a closed spinning string. The values obtained are invariant under gauge transformations. Using series expansion in ksub(ν) vector, Lorentz-covariant conservation laws for momentum, for Pauli-Lyubarski vector and so on, can be obtained.

50186 **(IFVE-OTF—82-126) Charm production in πpp interactions in parton model.** Likhoded, A.K.; Slabospitskij, S.R.; Suslov, M.V. (Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Serpukhov. Inst. Fiziki Vysokikh Ehnergij). 1982. 14p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703401.

Charmed particle production in π^-p collisions is considered, taking into account the interaction (recombination) of charmed quarks with valence quarks and valence-sea diquarks from π^- mesons. The differential and total cross sections for charmed particle production are calculated in agreement with the experimental data. It is shown that the predictions of "intrinsic" charm model contradict experimental data in 360 GeV π^-p collisions. In the process of hadronization of charmed quarks the account for interaction with valence quarks from the initial hadron leads to the production of more fast charmed hadrons in comparison with processes of fragmentation of quarks. The account for such an interaction leads to the change of yields of charged and neutral D mesons, D and Asub(c) particles.

50187 **(JINR—R-2-82-75) Elastic πp scattering in quark model in the Glauber formalism.** Omboo, Z.; Pak, A.S.; Saakyan, S.B.; Tarasov, A.V. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems). 1982. 4p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702272.

Within the relativistic generalization of the Glauber model the data on elastic πp scattering are analysed at the Psub(π)=momentum transfer range. Parameters of the pion and proton wave functions are defined in the framework of the relativistic harmonic oscillator model.

50188 **(JINR—R-2-82-80) Anomalous dimension quark counting for singlet distributions.** Avaliani, I.S.; Matveev, V.A.; Slepchenko, L.A. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics). 1982. 12p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702273.

Effect of scaling breaking of the inclusive cross sections in the processes at high transverse momentum are considered. The anomalous dimension quark couting rules are formulated in the framework of the QCD leading order and taking into account the singlet functions of parton distributions.

50189 **(KFKI—1982-86) KNO distributions using the generalization of Novero-Predazzi's ansatz with three constraints.** Krasznovszky, S.; Wagner, I. (Hungarian Academy of Sciences, Budapest. Central Research Inst. for Physics). Dec 1982. 18p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703404.

The method of Novero-Predazzi is applied to a set of ansaetze (m=1, 2, 3...) with three constraints. Hadronic production cross-section sigmasub(n)(s) satisfying KNO-like constraints is determined. sigmasub(n)(s) and <n>Psub(n) automatically have KNO scaling property. The generalization of the method is investigated for more than three constraints. Comparing their results with the published data for m=1, 2,...9 the authors have found that all calculated higher moments csub(k) of the KNO distribution for m=2 were in excellent agreement with the observed values of csub(k)-s for pp interactions at Serpukhov, FNAL and ISR energies.

50190 **(KFKI—1982-99) Hadron spectrum calculations at strong coupling in lattice QCD.** Hasenfratz, A. (Hungarian Academy of Sciences, Budapest. Central Research Inst. for Physics). Nov 1982. 14p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703405.

Replacing the projection operator in Wilson's lattice action by (r+-γsub(ν)), the low-lying hadron spectrum is calculated in the strong coupling limit. The value of the critical hopping parameter is given as the function of r.

50191 **(NBI-HE—82-45) Fermionic strings with boundary terms. II. The O(2) string.** Di Vecchia, P.; Durhuus, B.; Olesen, P.; Petersen, J.L. (Niels Bohr Inst., Copenhagen (Denmark)). Oct 1982. 18p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702274.

The authors compute the boundary terms for the O(2) string by use of Polyakov's approach to the quantization problem. The effective action is conformally U(1) invariant, but breaks chiral invariance.

50192 **(RL—82-088) Qanti-QG hermaphrodite mesons in the MIT bag model.** Barnes, T.; Close, F.E.; Viron, F. de. (Science Research Council, Chilton (UK). Rutherford and Appleton Labs.). Oct 1982. 49p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83703407.

It is suggested that hermaphrodite (qanti-qg) mesons could exist with rather light masses. The spectrum of the ground state nonets, Jsup(PC) = (0, 1, 2)$^{-+}$; 1^{--} is calculated in the MIT bag model including 0(asub(s)) energy shifts. Hadronic transitions among these states are discussed, considering their possible production at LEAR and SPEAR and indicating some interesting decay signatures.

50193 **(SLAC-PUB—3190) Word of caution.** Quinn, H.R. (Stanford Linear Accelerator Center, CA (USA)). Aug 1983. Contract AC03-76SF00515. 5p. (CONF-830689—3). NTIS, PC A02/MF A01. Order Number DE83016678.

From 14. international symposium on multiparticle dynamics; Lake Tahoe, NV, USA (1 Jun 1983).

It is stated that we should discard the phrase testing QCD and talk instead of studying the phenomenology of perturbative QCD. If the data lead to discrepancies with perturbative predictions plus hadronization models, we may learn something about the possible non-perturbative effects, but we will almost certainly not be led to discard QCD. Meanwhile, when the model works, we are continually reinforcing the view that our assumptions about hadronization as a soft process work well, and that the underlying hard parton process does indeed follow the behavior calculated from perturbative QCD.

50194 **(UNIGRAZ-UTP—01-83) Deuteron form factors and e-d polarization observables for the Paris and Graz-II potentials.** Schwarz, K.; Plessas, W.; Mathelitsch, L. (Graz Univ. (Austria)). 1983. 9p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703409.

Elastic e-d scattering is studied employing the meson-theoretical Paris potential and the non-local separable Graz-II potential. Electric and magnetic form factors are calculated with inclusion of meson-exchange currents and compared to existing experimental data. Deuteron vector and tensor polarizations are predicted and discussed in relation to the deuteron wave functions of the potential models considered. Thereby the off-shell behaviour of the Graz-II interaction is found to be close to that one of the Paris potential over the most important domain of low and moderate off-shell momenta.

50195 **(UNIGRAZ-UTP—02-83) Sensitivity of N-d polarization observables on the off-shell behavior of the N-N interaction.** Zankel, H.; Plessas, W.; Haidenbauer, J. (Graz Univ. (Austria)). 1983. 13p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703408.

We demonstrate the off-shell sensitivity of second-order polarization observables in elastic N-d scattering by means of the spin-correlation parameter Csub(y,y). For the N-N interaction we start with the Paris potential and then generate on-shell equivalent sepa-

rable potentials with different off-shell properties. The results for Esub(d)d = 10 and 20 MeV reported here show sizeable off-shell effects, which can be related to the different potential behavior in the inner region r approximately 1.2 fm.

50196 (USIP—82-05) Higgs boson events and background LEP. A Monte Carlo study. Ekspong, G.; Hultqvist, K. (Stockholm Univ. (Sweden). Fysiska Institutionen). Jun 1982. 20p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702275.

Higgs boson production at LEP using e+ e- to Z ° to H° + e+ e- has been studied by Monte Carlo generation of events with realistic errors of measurement added. The results show the recoil mass (Higgs boson mass) resolution to be reasonably good for boson masses bigger than 5 Ge V. The events are found to populate a phase space region free of physical background for all boson masses below about 35 GeV. For masses above 40 GeV the Higgs boson signal merges with the physical background produced by semileptonic decays of heavy flavour quarks while diminishing in strength to low levels. The geometrical acceptance of a detector like DELPHI is about 80 per cent for Higgs boson events.

50197 (UWThPh—82-1) Comparison of the quark bound state masses for various potentials. Flamm, D.; Schoeberl, F. (Vienna Univ. (Austria)). 1982. 11p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702276.

We test the assumption of a universal flavor independent potential by applying several potentials which give good results for mesons to the baryon case. To calculate the mass spectrum we propose a variational method based on an expansion in terms of harmonic oscillator wave functions. A comparison with other approximation schemes favors our method.

50198 (UWThPh—82-3) Hadronic final states in the decay $Z^0 \to W^{+-} X^{-+}$ and the weak boson self-coupling. Rupertsberger, H.; Svozil, K. (Vienna Univ. (Austria)). 1982. 12p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702280.

To determine the non-abelian gauge structure of the standard unified electro-weak theory the detection of the weak boson self-coupling is essential. Effects of this interaction for the decay $Z^0 \to W^{+-} X^{-+}$, where X^{-+} is an arbitrary hadronic state, are calculated and shown to be of the order of 40%.

50199 (UWThPh—82-6) Electromagnetic field of a rotating closed singular magnetic flux-line. Rupertsberger, H. (Vienna Univ. (Austria)). 1982. 5p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702281.

The electromagnetic field due to the rotation of a circular singular magnetic flux-line is calculated. Averaging the resulting electric field over the period of rotation it is shown that by this procedure neither a static Coulumb charge nor an electric dipole moment can be generated.

50200 (WIS-PH—82/2) Are there dinucleon states of three diquarks. Lipkin, H.J. (Weizmann Inst. of Science, Rehovoth (Israel). Dept. of Nuclear Physics). Jan 1982. 6p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702283.

The pseudoscalar dibaryon state proposed as a possible diquark deuteron does not exist. The lowest state of the system of three color-triplet scalar diquarks has the same quantum numbers as the deuteron. It might be mixed into the physical deuteron wave function but would not be observed as a separate narrow state.

50201 (WIS-PH—82/8) Why explicit gluonic components are needed in multiquark wave functions. Lipkin, H.J. (Weizmann Inst. of Science, Rehovoth (Israel). Dept. of Nuclear Physics). Mar 1982. 12p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702291.

Constituent quark models with nontrivial correlations between color and space and no explicit description of the gluon degrees of freedom are inconsistent with local color gauge invariance. The screening by gluons of local color density in the quark sector must be included in treatments of long range forces in multiquark states. Neglect of gauge invariance and screening leads to erroneous predictions like unobserved Van der Weals forces and unobserved "baryonium" states with localized color.

50202 (WIS-PH—82/24) Hadron couplings to Goldstone bosons in QCD. Reinders, L.J.; Rubinstein, H.R.; Yazaki, S. (Weizmann Inst. of Science, Rehovoth (Israel). Dept. of Nuclear Physics). May 1982. 23p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702284.

We calculate coupling constants in QCD by extrapolating from the asymptotic freedom regime using QCD sum rules. The novel feature is that these amplitudes are dominated by the quark condensate when one leg is a pseudoscalar Goldstone boson. We find many couplings and in particular the remarkable formulas gsub(πNN/4π)^2 approximately equal to $2^5\pi^3$fsub(π^2)/Msub(N)^2 and gsub(ωrhoπ)=2fsub(rho)/msub(rho)[e/2$\sqrt{2}$].

50203 (WIS-PH—82/27) QCD derivation of the additive quark model from two and three gluon exchanges. Lipkin, H.J. (Weizmann Inst. of Science, Rehovoth (Israel). Dept. of Nuclear Physics). Jun 1982. 9p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702286.

The contributions to the Pomeron from two and three gluon exchanges are shown to give the correct combinatorial factors for the additive quark model relation between meson and baryon Pomeron couplings, even though two-quark and three-quark operators are involved. Similar results hold for the contributions to hadron masses from three-gluon vertices as well as one-gluon exchange. The color algebra reduces the multiquark couplings to a linear function of quark number.

50204 (WIS-PH—82/28) Hyperon magnetic moments and total cross sections. Glues to QCD or the generation puzzle. Lipkin, H.J. (Weizmann Inst. of Science, Rehovoth (Israel). Dept. of Nuclear Physics). Jun 1982. 26p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702287.

The new data on both total cross sections and magnetic moments are simply described by beginning with the additive quark model in an SU(3) limit where all quarks behave like strange quarks and breaking both additivity and SU(3) simultaneously with an additional non-additive mechanism which affects only nonstrange quark contributions. The suggestion that strange quarks behave more simply than nonstrange may provide clues to underlying structure or dynamics. Small discrepancies in the moments are analyzed and shown to provide serious difficulties for most models if they are statistically significant.

50205 (WIS-PH—82/31) Comparative study of the NNπ system I. The πd$\to\pi$d, πd$\to$NN channels. Rinat, A.S.; Starkand, Y. (Weizmann Inst. of Science, Rehovoth (Israel). Dept. of Nuclear Physics). Jun 1982. 59p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702288.

Numerical results are presented for πd$\to\pi$d, πd reversible NN observables for 290 >=Tsub(π)(MeV) >=50. We discuss sensitivity of predictions for various input elements like the d-formfactor, the range of the NNπ vertex and the parametrization of the background part of the $P_{11}\pi$N scattering matrix and remark on possible parallels for A(π,π) and A(π,2N) amplitudes. A comparison is made with previously obtained results of similar scope.

50206 (WIS-PH—82/33) Study of charge symmetry breaking effects in elastic πip d scattering. Rinat, A.S.; Alexander, Y. (Weizmann Inst. of Science, Rehovoth (Israel). Dept. of Nuclear Physics). Jun 1982. 20p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702289.

We computed external Coulomb and some strong charge symmetry breaking (CSB) effects in π^{+-}d$\to\pi^{+-}$d. These appear to account for charge asymmetry of differential cross sections, while approximate CSB spoils the agreement. We further report on a critical study of CSB effects extracted from π^{+-}d total cross section differences.

50207 **(DESY-L-Trans—266) Impossibility of a scalar tachyon.** Faingold, M.I. (Deutsches Elektronen-Synchrotron (DESY), Hamburg (Germany, F.R.)). Jun 1982. Translation source information not available . 4p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83780872.

Published in Ukr. Fiz. Zh., 27(3), 440-442 (1982).

It is the purpose of this paper to prove that a preferred space direction is coupled with each tachyon and, consequently, scalar tachyons, are impossible in principle. Even the notion of a scalar faster-than-light particle cannot be defined in a relativistically invariant way.

6453 Particle Invariance Principles And Symmetries

REFER ALSO TO CITATION(S) 50105, 50226, 50233, 50241

50208 **(IC—81/204) Equivalence of L-diminishing operator and the Hill-Wheeler projection technique and its application to the five-dimensional harmonic oscillator.** Gozdz, A. (International Centre for Theoretical Physics, Trieste (Italy)). Oct 1981. 17p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702240.

In this paper, a relation between the Hill-Wheeler integral and L-lowering operator is stated and has been used to construct the orthonormal physical basis for the symmetric irreducible representations of the group SO(5).

50209 **(IC—82/105) Local Nicolai mappings in extended supersymmetry.** Cecotti, S.; Girardello, L. (International Centre for Theoretical Physics, Trieste (Italy)). Jul 1982. 12p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702453.

We show that in extended supersymmetry (without gauge fields) the Nicolai mapping is local in any dimension. The argument gives explicitly the mapping for all dimensions (we present explicit examples for D = 1, 2, 3, and 4).

50210 **(IC—82/114) Supersymmetric GUTs and cosmology.** Lazarides, G.; Shafi, Q. (International Centre for Theoretical Physics, Trieste (Italy)). Jun 1982. 15p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702457.

By examining the behaviour of supersymmetric GUTs in the very early universe we find two classes of realistic models. In one of them supersymmetry is broken at or near the superheavy GUT scale. The cosmological implications of such models are expected to be similar to those of nonsupersymmetric GUTs. In the second class of models, the superheavy GUT scale is related to the supersymmetry breaking scale a la Witten. Two types of cosmological scenarios appear possible in this case, either with or without an intermediate (new) inflationary phase. They can be experimentally distinguished, since the former predicts an absence and the latter an observable number density of superheavy monopoles. A mechanism for generating baryon asymmetry in such models is pointed out. Further constraint on model building appears if global R invariance is employed to resolve the strong CP problem.

50211 **(IC—82/116) Mass splitting induced by gravitation.** Maia, M.D. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1982. 20p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702458.

The exact combination of internal and geometrical symmetries and the associated mass splitting problem is discussed. A 10-parameter geometrical symmetry is defined in a curved space-time in such a way that it is a combination of de Sitter groups. In the flat limit it reproduces the Poincare-group and its Lie algebra has a nilpotent action on the combined symmetry only in that limit. An explicit mass splitting expression is derived and an estimation of the order of magnitude for spin-zero mesons is made.

50212 **(IC—82/144) Stability analysis of non-topological solitons in gauge theory and in electrodynamics.** Chakrabarti, S. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1982. 19p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702462.

The Lyapunov stability analysis of the nontopological soliton solution in the many-charge Qsub(i) Synge Model in non-Abelian SU(2)xU(1) symmetry with the presence of gauge fields is considered. It is shown that in the presence of the subsidiary condition of fixation of charges Σsub(i)ωsub(i)delta Qsub(i)=0 the necessary condition for stability of the soliton solution (periodic in time with parameters ωsub(i)) is defined by the inequality: Σsub(i,k) (deltaQsub(i)²/deltaωsub(k)) - ωsub(i)ωsub(k)<0. This condition holds for any Lagrangian density with second-order time derivatives in the presence of gauge fields. This result is extended to the stability analysis of a scalar soliton with electromagnetic field in U(1) symmetry, and it is shown that, in this case, the necessary condition reduces to deltaQsub(i)/deltaω<0.

50213 **(IC—82/193) J-R solitons in BSS supersymmetry theory.** Xinzhou, L.; Jianzu, Z.; Kelin, W. (International Centre for Theoretical Physics, Trieste (Italy)). Sep 1982. 13p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702467.

We deduce Jackiw-Rebbi solitons from the Brink-Schwarz-Scherk model which is a minimal supersymmetry theory in Msup(5.1) space-time. In the case of the monopole, we obtain the same result as Jackiw and Rebbi for both the scalar and pseudoscalar Higgs fields. In the case of the dyon, the situation is the same.

50214 **(IFVE-NTL—81-164) One-long QCD corrections for nonleptonic ΔS = 0 weak Hamiltonian in sic-quark models.** Babaev, Z.R.; Gelmi, L.; Zamiralov, V.S.; Zenkin, S.V. (Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Serpukhov. Inst. Fiziki Vysokikh Ehnergij). 1981. 28p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83703400.

Gluon correlations for the weak nonleptonic Hamiltonian with ΔS=0 are evaluated with account for heavy quark made masses. Group-theory operator basis has been constructed which enables to use a universal matrix of an anomalous dimension and to obtain compact algebraic expressions for the renormalized Hamiltonian coefficients. An essential dependence of the results upon the choice of electroweak interaction model was demonstrated. A calculated value for pion asymmetry parameter Asub(π) proves to be 2.3 in the Kobayashi-Maskawa model and -0.2 in the V-like model.

50215 **(IFVE-OTF—82-35) Bogolyubov transformation for the Poincare group.** Sveshnikov, K.A. (Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Serpukhov. Inst. Fiziki Vysokikh Ehnergij). 1982. 13p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702486.

The covariant generalization of the Bogolyubov transformation for the Poincare group directly for quantized variables in lagrangian formalism has been considered. The whole quantization procedure has been considered in detail for the case of a scalar field in two-dimensional space-time. Transition to more complicate models is not trivial and to simplify formulae, it has been cosidered only schematically. The considered procedure of the Poincare group separation allows to avoid using hamiltonian formalism of systems with couplings. The simplest examples considered have the obvious physical interpretation in terms of the group of motions of the relativistic particle system.

50216 **(IFVE-OTF—82-147) Self-consistent chiral doublet composite scheme.** Pirogov, Yu.F. (Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Serpukhov. Inst. Fiziki Vysokikh Ehnergij). 1982. 8p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702485.

A composite scheme with chiral doublet of charges Q=(2/3, -1/3) is considered. The scheme is self-consistent in the sense that the constituent spectator chiral symmetry SU(2)xU(1) coincides with the chiral electro-weak symmetry. Due to the mirror fermions they both are anomaly free. The chiral colour symmetry arises as an effective symmetry of composite quarks. The scheme contains exotic composite fermions with isospin I=3/2. The common maximal effective symmetry of both ordinary and exotic composite fermions is the chiral SU(2)xSU(4) one, the latter being possible partial unified symmetry.

50217 (IHEP-ONF—82-32) Analysis of reaction νsub(μ)p $\rightarrow \mu^- p\pi^+$ in the theory of broken chiral symmetry. Bel'kov, A.A.; Klimenko, L.A.; Zudin, Yu.A. (Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Serpukhov. Inst. Fiziki Vysokikh Ehnergij). 1982. 17p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703402.

The reactions νsub(μ)N$\rightarrow\mu$sup(-)Nπ are considered in the chiral phenomenological Lagrangian realization of the hard pion model at low energy. Analysis of experimental data on the differential cross-section dσ/dk^2 proves that in the region of small lepton momentum transfer -k^2<0.2 (GeV/c)^2 this process may be described by the hard pion model. The values of ΔNA_1 and ΔNrho coupling constants are defined to be β_1=2.8+-2.7 and β_2=2.60+-0.32, respectively. Analysis of reactions νsub(μ)N $\rightarrow \mu^-$Nπ in the hard pion model can be used to test the theory of broken chiral symmetry and to give information on the interaction constants of π-, rho-, and A_1-mesons with various low-lying baryon resonances.

50218 (ITP—82-95-E) Dynamics of tumbling gauge theories. Gusynin, V.P.; Miransky, V.A.; Sitenko, Yu.A. (AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki). 1982. 16p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702495.

The dynamics of symmetry breaking in gauge theories without fundamental scalars is investigated. The method of determining the way of the vacuum rearrangement in these theories is elaborated.

50219 (JINR—E-2-82-288) Noninvariance of regularization by dimensional reduction. An explicit example of supersymmetry breaking. Avdeev, L.V. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics). 1982. 6p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702497.

By a direct calculation it is shown that at the threeloop level the regularization by dimensional reduction breaks supersymmetry relations between coupling constants in the N=1, 2, 4 supersymmetric Yang-Mills theories written in terms of component fields. This is a strong limitation to the scope of the regularization.

50220 (JINR—E-2-82-598) SU(3) gluon condensate from lattice MC data. Ilgenfritz, E.M.; Muller-Preussker, M. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics). 1982. 6p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702500.

The SU(3) gluon condensate is determined from a fit to the Creutz ratios of Wilson loop expectation values taken from new Monte-Carlo data. The result agrees with the phenomenological value very well.

50221 (UWThPh—82-32) SU(5) at very high energies. Hueffel, H. (Vienna Univ. (Austria)). 1982. 9p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702506.

By exhibiting the relationship between the full SU(5) theory in the unitary gauge and the underlying Higgs-Goldstone system in the t'Hooft-Feynman gauge the high energy limits of amplitudes (involving gauge and Higgs bosons) can be calculated easily. As an application tree unitarity bounds on Higgs parameters and masses are discussed.

50222 (UWThPh—82-34) Symmetry breaking pattern SU(5) $\rightarrow$ SU(3) x U(1) including one loop radiative corrections. Fraser, C.M.; Hueffel, H. (Vienna Univ. (Austria)). 1982. 13p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702507.

We derive conditions on the Higgs parameters of the minimal SU(5) model under which the phenomenologically desired symmetry breaking pattern SU(5) $\rightarrow$ SU(3) x U(1) persists at the one loop level.

50223 (WIS-PH—82/13) Massless composite fermions and discrete chiral symmetries. Harari, H.; Seiberg, N. (Weizmann Inst. of Science, Rehovoth (Israel). Dept. of Nuclear Physics). Mar 1982. 11p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702282.

Massless composite quarks and leptons require unbroken chiral symmetries. The 't Hooft anomaly conditions usually prevent the construction of realistic models with such symmetries. We consider a class of models in which the original chiral symmetry is broken, leaving a conserved discrete chiral group, allowing for massless composite fermions but evading the 't Hooft condition. Several explicit examples are considered. In all cases, the massless fermions are accompanied by Goldstone bosons which, however, decouple from all low-energy phenomena.

50224 (WIS-PH—82/26) Formulating weak CP-violation in terms of quark mass hierarchies. Davidson, A. (Weizmann Inst. of Science, Rehovoth (Israel). Dept. of Nuclear Physics). Jun 1982. 15p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702285.

That physics which explains Cabibbo mixing is shown to also put a lower bound on Kobayashi-Maskawa CP-violation. The observed amount epsilon = 0.002 of CP-violation in the Ksub(L) - Ksub(S) system in turn sharply requires 25 GeV <= msub(t) <= 59 GeV; msub(t) being the top-quark mass. Assuming a vanishing weak (ala strong) CP-violation amplitude for msub(u) $\rightarrow$ 0, as strongly indicated by the data, epsilon is formulated as a second order quantity in the fermionic mass hierarchy.

6454 Field Theory

REFER ALSO TO CITATION(S) 50179, 50180, 50190, 50212, 50351

50225 (CEA-CONF—6489) Quantum field theory and statistical mechanics. Brezin, E. (CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France)). Jul 1982. 12p. (CONF-820718—38). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702451.

From 21. international conference on high energy physics; Paris, France (29 Jul 1982).

Lattice gauge theories have been extensively studied by Monte-Carlo simulations. In this talk some analytic methods (frequently inspired by statistical mechanics) are presented. Several results are quite recent and I believe that these methods should play an increasing role in the understanding of QCD. However most of the material is completely standard and this report should not be read by specialists.

50226 (DOE/ER/70004—323) Grand unification and strong CP problem. Deshpande, N.G. (Oregon Univ., Eugene (USA)). Jan 1982. Contract AT06-76ER70004. 6p. (CONF-820135—3). NTIS, PC A02/MF A01. Order Number DE83015432.

From International colloquium on baryon nonconservation; Bombay, India (11 Jan 1982).

Many solutions to the strong CP problem have been suggested in the literature, the most attractive one being due to Peccei and Quinn. The basic idea here is to impose an axial U(1) symmetry on the SU(3)/sub c/ x SU(2) x U(1) theory, such that there is an axial quark current A/sub μ/ that is conserved up to anomalies. A chiral rotation can then restore CP conservation. The way this symmetry was implemented in SU(3)/sub c/ x SU(2) x U(1), through two Higgs doublets, necessarily lead to a pseudo-Goldstone boson, called axion of mass f/sub π/M/sub π//M/sub W/ $\sim$ 100 KeV and coupling to quarks $\sim$ f/sub π/M/sub W/ $\sim 10^{-3}$. Such an axion was looked for but not found. Recently, Dine, Fischler and Srednicki (DFS) have suggested that a SU(2) x U(1) singlet Higgs transforming non trivially under U/sub PQ/(1) and with a large expectation value renders the axion essentially invisible. If M/sub X/ is the expectation value of the singlet Higgs, mass of the axion M/sub a/ $\sim$ f/sub π/M/sub π//M/sub X/ and pseudoscalar coupling $\sim$ f/sub π//M/sub X/. In grandunified theories we can get fields with large expectation values, which can be singlets under SU(2) x U(1). The implementation of the DFS idea in grand unified theories is discussed. (WHK)

50227 **(EFI—495(38)-81) Lorentz-invariance and vacuum fields.** Tevikian, R.V. (Erevanskij Fizicheskij Inst. (USSR)). 1981. 12p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702452.

It is shown that for the complete description of the particle fields at E → infinity it is necessary to introduce bose- and fermi-vacuum fields. It is proved that in the Einstein equations it is necessary to ihtroduce a cosmological term proportional to the square of the bose-vacuum field strength.

50228 **(IC—81/151) Lattice gauge theories and Monte Carlo simulations.** Rebbi, C. (International Centre for Theoretical Physics, Trieste (Italy)). Nov 1981. 67p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702228.

After some preliminary considerations, the discussion of quantum gauge theories on a Euclidean lattice takes up the definition of Euclidean quantum theory and treatment of the continuum limit; analogy is made with statistical mechanics. Perturbative methods can produce useful results for strong or weak coupling. In the attempts to investigate the properties of the systems for intermediate coupling, numerical methods known as Monte Carlo simulations have proved valuable. The bulk of this paper illustrates the basic ideas underlying the Monte Carlo numerical techniques and the major results achieved with them according to the following program: Monte Carlo simulations (general theory, practical considerations), phase structure of Abelian and non-Abelian models, the observables (coefficient of the linear term in the potential between two static sources at large separation, mass of the lowest excited state with the quantum numbers of the vacuum (the so-called glueball), the potential between two static sources at very small distance, the critical temperature at which sources become deconfined), gauge fields coupled to basonic matter (Higgs) fields, and systems with fermions.

50220 **(IC—81/152) Scaling violation in QCD.** Furmanski, W. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1981. 60p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702229.

The effects of scaling violation in QCD are discussed in the perturbative scheme, based on the factorization of mass singularities in the light-like gauge. Some recent applications including the next-to-leading corrections are presented (large psub(T) scattering, numerical analysis of the leptoproduction data). A proposal is made for extending the method on the higher twist sector.

50230 **(IC—81/158) Higgs phenomenon via gauge invariants.** Magpantay, J.A. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1981. 12p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702230.

We show that in the Abelian-Higgs model we can define gauge-invariant scalar and vector fields that exhibit the Higgs phenomenon.

50231 **(IC—81/166) Laplace transform of the Weinberg type sum rules.** Narison, S. (International Centre for Theoretical Physics, Trieste (Italy)). Sep 1981. 14p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702232.

We consider the Laplace transform of various sum rules of the Weinberg type including the leading non-perturbative effects. We show from the third type Weinberg sum rules that 7.5 to 8.9 <or approx. msub(s)-circumflex/msub(d)-circumflex <or approx. 22.5 to 26.6 for the sum rule scale value M approx.= Msub(rho) of the order of Msub(phi). We also deduce an upper bound to the by-product msub(u)-circumflex msub(d)-circumflex of light quark invariant masses. The first Weinberg sum rule allows us to get a lower bound on fsub(π) and on the A_1 coupling to the W boson, while the second sum rule gives an upper bound on the A_1 mass (Msub(A_1) <or approx. 1.25 GeV).

50232 **(IC—81/172) Role of gauge invariance in a variational and mean-field calculation.** Masperi, L.; Omero, C. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1981. 13p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702233.

We show that the implementation of gauge invariance is essential for a variational treatment to correctly reproduce all the features of the phase diagram for the Z(2) lattice gauge theory with matter field.

50233 **(IC—81/187) Low mass parity restoration, weak interaction phenomenology and grand unification.** Parida, M.K.; Raychaudhuri, A. (International Centre for Theoretical Physics, Trieste (Italy)). Sep 1981. 41p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702271.

The question of low energy restoration of parity is examined using a left-right asymmetric model implied by the gauge group SU(2)sub(L)xSU(2)sub(R)xU(1)sub(B-L) with gsub(L)>gsub(R), both from a phenomenological point of view and also exploiting the possibility that such an asymmetry may be a consequence of two-stage symmetry breaking of SU(2)sub(R) allowed in the SU(16) grand unification scheme. We carry out all the charged and neutral current tests with somewhat increased errors of the measured values of neutral current parameters. The phenomenological asymmetric model passes all the tests permitting $1<=(gsub(L)/gsub(R))^2<=2$ and $0.23<=sin^2thetasub(w)<=0.29$, where the case gsub(L)/gsub(R)=1 corresponds to the symmetric model investigated by Rizzo and Senjanovic. Whereas low-energy parity restoration and low mass gauge bosons may be possible in the symmetric model, the phenomenological asymmetric model allows a low mass right-handed charged gauge boson (86-230 GeV) and a low mass neutral boson (190-455 GeV), in addition to the two gauge bosons of first generation, but no parity restoration. It is shown that all the results of analysis of the phenomenological asymmetric model, for the case of no mixing between left- and right-handed charged gauge bosons still hold true in the case where the left-right asymmetry arises out of two stage symmetry breaking of SU(2)sub(R) allowed by SU(16) grand unification, but only with the replacement of the charged right-handed boson by a heavier one ($>10^4$ GeV). The SU(16) interpretation of left-right asymmetry and the available charged and neutral current data allow the second neutral boson to be observed, together with the two gauge bosons of first generation, but no restoration of parity at ISABELLE energies. However, the parity restoration, if any, may be possible at energies > or approx. 10^4 GeV. Several other observable distinctions of the asymmetric model from the standard one and the symmetric model are pointed out.

50234 **(IC—81/200) Variational discussion of the Hamiltonian Z(N) spin model in 1+1 and 2+1 dimensions.** Jengo, R.; Masperi, L.; Omero, C. (International Centre for Theoretical Physics, Trieste (Italy)). Oct 1981. 19p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702239.

We study the Z(N) spin model, as well as its limiting forms for N → infinity by means of a variational approach. We find for 1+1 dimensions a signal of one disorder-massless and one massless-order phase transition, and in 2+1 dimensions evidence for a disorder-order transition. A possible massless-order transition which appears with some ansatz in the latter case is ruled out by other trial states with lower energy.

50235 **(IC—82/63) Conformal techniques for OPE in asymptotically free quantum field theory.** Craigie, N.S.; Dobrev, V.K.; Todorov, I.T. (International Centre for Theoretical Physics, Trieste (Italy)). Jun 1982. 48p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702473.

We discuss the relationship between the short-distance behaviour of vertex functions and conformal invariance in asymptotically free theories. We show how conformal group techniques can be used to derive spectral representations of wave functions and vertex functions in QCD.

50236 **(IC—82/79) Evolution kernel for the Dirac field.** Baaquie, B.E. (International Centre for Theoretical Physics, Trieste (Italy)). Jun 1982. 33p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702478.

The evolution kernel for the free Dirac field is calculated using the Wilson lattice fermions. We discuss the difficulties due to

which this calculation has not been previously performed in the continuum theory. The continuum limit is taken, and the complete energy eigenfunctions as well as the propagator are then evaluated in a new manner using the kernel.

50237 **(IC—82/106) Quantization of a conformal invariant pure spinor model.** Akdeniz, K.G.; Hortacsu, M.; Pak, N.K.; Arik, M.; Durgut, M.; Kaptanoglu, S. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1982. 17p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702454.

The Gursey model, a conformally invariant pure spinor model in four dimensions, is shown to yield a renormalizable field theory, which is asymptotically free in the phase which has discrete γ_5-invariance.

50238 **(IC—82/130) Light spinor-monopole.** Xinzhou, L.; Kelin, W.; Jianzu, Z. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1982. 11p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702460.

In this paper, we suggest that the monopole may have a light mass, which gives the possibility to avoid a conflict between the cosmology and grand unification theory.

50239 **(IFVE-OTF—82-104) Infrared asymptotics of the Green functions in (QED)$_3$.** Nekrasov, M.L.; Rochev, V.E. (Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Serpukhov. Inst. Fiziki Vysokikh Ehnergij). 1982. 15p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702483.

The asymptotics of the two-point Green functions at $p/e^2 << 1$ (e is the coupling constant) are obtained in massless three-dimensional spinor electrodynamics. The infrared behaviour of the fermion propagator const p is obtained from an analysis of the gauge transformation law of the fermion propagator. Generalisation of the Green function method in the infrared region is proposed for the massless theory. By this method the above result for the fermion propagator is confirmed and the infrared asymptotics of the photon propagator is found.

50240 **(IFVE-OTF—82-127) Absence of free quarks in QCD in the framework of perturbation theory.** Kamenshchik, A.Yu.; Sveshnikov, N.A. (Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Serpukhov. Inst. Fiziki Vysokikh Ehnergij). 1982. 9p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702484.

In QCD with massive quarks it is shown that the selfconsistency condition of the scattering theory in the asymptotic dynamics representation leads to the statement that there are no free quarks in asymptotic states on the level of perturbation theory.

50241 **(ITEP—6(1982)) Integration over Fermi fields in chiral and supersymmetric theories.** Vainshtein, A.I.; Zakharov, V.I. (Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Moscow. Inst. Teoreticheskoj i Ehksperimental'noj Fiziki). 1982. 12p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702492.

Chiral and supersymmetric theories are considered which cannot be formulated directly in Euclidean space or regularized by means of massive fields in a manifestly gauge invariant fashion. In case of so called real representations a simple recipe is proposed which allows for unambiguous evaluation of the fermionic determinant circumventing the difficulties mentioned. As application of the general technique the effective fermionic interactions induced by instantons of small size within simplest chiral and supesymmetric theories are calculated (SU(2) as the gauge group and one doublet of Weyl spinors or a triplet of Majorana spinors, respectively). In the latter case the effective Lagrangian violates explicitly invariance under supersymmetric transformations on the fermionic and vector fields defined in standard way.

50242 **(JINR—E-2-82-413) Stability and dynamical properties of solitons in the framework of the two-field model of the classical field theory.** Sautbekov, S.S.; Shvachka, A.B. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation). 1982. 4p. (CONF-820718—34). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702243.

From 21. international conference on high energy physics; Paris, France (29 Jul 1982).

Dynamic properties and the stability region of the soliton solution in the range of two-field scalar model of the classical field theory were investigated. Dynamical properties of solitons and the types of soliton interaction have been studied by means of the computer simulations. It is shown that the types of interactions of quasi-solitons are the same as for pulsons investigated earlier in the frame of the Klein-Gordon equation with cubic nonlinearity.

50243 **(JINR—R-2-82-35) Solutions of classical Yang-Mills equations with external sources. Numerical study of two-centre nonlinear problem.** Kaschieva, V.A.; Kaschiev, M.S.; Katyshev, Yu.V.; Makhaldiani, N.V.; Makhan'kov, V.G.; Puzynin, I.V. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation). 1982. 25p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702246.

The necessary conditions for the existence of stationary solutions with finite energy to the Yang-Mills equations with external sources are obtained. For a special form of the external source the nonlinear two-centre problem is formulated. Using continuous analog of Newton method and the method of finite element for discretization the solutions with finite energy and zero total colour charge are obtained.

50244 **(KFKI—1982-110) Confinement of dynamic quarks.** Szlachanyi, K. (Hungarian Academy of Sciences, Budapest. Central Research Inst. for Physics). Jan 1983. 17p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703403.

The authors propose a physical picture and a non-perturbative definition of confinement in lattice gauge theories with matter fields. They argue that in the thermodynamical limit the fractional (baryon) charges become unobservable in the confinement phase for all local measurements. As an illustration they have tested the criterion in three of the possible phases of the Z(N) matter-gauge system by means of perturbation theory. They have found that the usual confinement and Higgs phases show confinement, while the free phase contains fractionally charged states contributing to local physical quantitites.

50245 **(LA-UR—83-2162) Special functions and group theory in theoretical physics.** Biedenharn, L.C.; Gustafson, R.A.; Lohe, M.A.; Louck, J.D.; Milne, S.C. (Los Alamos National Lab., NM (USA)). 1983. Contract W-7405-ENG-36. 36p. (CONF-830382—1). NTIS MF A01. Order Number DE83015642.

From Conference on special functions in group theory; Oberwolfach, F.R. Germany (13 Mar 1983).

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The subject of special functions, even where restricted to the narrower subject of special functions in theoretical physics, is far too broad for one to attempt any meaningfully complete survey. We attempt to review the important main themes in the subject and then show how recent advances broadened and extended these themes.

50246 **(NBI-HE—82-47) Physical anomaly on the lattice.** Kawamoto, N.; Shigemoto, K. (Niels Bohr Inst., Copenhagen (Denmark)). Nov 1982. 19p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702248.

The authors study the axial anomaly of chiral non-invariant generalized Wilson's action and point out a possibility that physical anomaly which is responsible for $\pi^0 \to 2\gamma$ decay and π-eta-eta' mass difference vanishes. The physical anomaly is different from the commonly defined anomaly which has correct magnitude.

50247 **(RL—82-076) New approach to spectrum calculations in lattice Hamiltonian field theories. 1. Introduction and application to lambda phi⁴ in (1+1) dimensions.** Barnes, T.; Daniell, G.J. (Science Research Council, Chilton (UK). Rutherford and Appleton Labs.). Sep 1982. 29p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83703406.

A finite lattice technique is introduced for calculating the spectrum of fluctuating Bose theories in the continuum limit. The method gives the continuum spectrum to an estimated approximately 1% accuracy in (1+1) dimensions using available computer memory. The spectrum of lambda phi⁴ theory in (1+1) dimensions is studied as a trial application; results are found consistent with a free theory spectrum.

50248 **(UWThPh—82-5) Dynamical and hamiltonian dilations of stochastic processes.** Baumgartner, B.; Gruemm, H.R. (Vienna Univ. (Austria)). 1982. 13p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702508.

This is a study of the problem, which stochastic processes could arise from dynamical systems by loss of information. The notions of "dilation" and "approximate dilation" of a stochastic process are introduced to give exact definitions of this particular relationship. It is shown that every generalized stochastic process is approximately dilatable by a sequence of dynamical systems, but for stochastic processes in full generality one needs nets.

50249 **(UWThPh—82-10) Introduction to gauge theories of electroweak interactions.** Ecker, G. (Vienna Univ. (Austria)). 1982. 55p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702277.

Intended as a lecture for physicists who are not familiar with the sophisticated theoretical models in particle physics. Starting with the standard gauge model of electromagnetic, weak and strong interactions the recent developments of a unified gauge theory of electroweak interactions are shown. Shortcomings in the unitarity problem of the V-A fermi theory of charged intermediate vector bosons. Presented are the spontaneous symmetry breaking in quantum mechanics, the abelian higgs model as an example of a spontaneously broken gauge field theory, the minimal gauge group of electroweak interactions, the fermion mass generation. Further on the anomalies in quantum field theory are discussed and the radiative corrections to the vector boson masses are considered.

50250 **(WIS-PH—82/6) Grand unified link between the Peccei-Quinn mechanism and the generation puzzle.** Davidson, A.; Wali, K.C. (Weizmann Inst. of Science, Rehovoth (Israel). Dept. of Nuclear Physics). Mar 1982. 57p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702290.

The essential ingredients of the Peccei-Quinn mechanism are shown to be dictated by a proper choice of a grand unification scheme. The presence of U(1)sub(PQ) gives rise to the possibility that the same physics which resolves the strong CP-violation problem may decode the generation puzzle with no extra cost. Multigenerational signatures of the invisible axion scenario, such as the canonical fermion mass matrix, are discussed. The uniqueness and the special values of the quantized PQ-assignments, namely 1,-3,5-7,... for successive generations, acquire an automatic explanation once the idea of "horizontal compositeness" is invoked. A characteristic feature then is that the muon appears to have a less complicated structure than the electron. Furthermore, U(1)sub(PQ) chooses SO(10) to be its only tenable gauge symmetry partner, and at the same time crucially restricts the associated Higgs system. All this finally results in a consistent fermion mass hierarchy with log m, to the crudest estimation, varying linearly with respect to the generation index.

6455 Scattering Theory

50251 **(JINR—E-2-82-595) Quadratic bundle of general form and the nonlinear evolution equations. Hierarchies of Hamiltonian structures.** Gerdjikov, V.S.; Ivanov, M.I. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics). 1982. 16p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702499.

Using the method of expansions over the "squared" solutions of the auxiliary linear problem, the class of nonlinear evolution equations related to the quadratic bundle of general form is described. It is proved, that these equations are completely integrable Hamiltonian systems, possessing hierarchies of Hamiltonian structures.

50252 **(UWThPh—82-19) Time delay and dilation properties in scattering theory.** Narnhofer, H. (Vienna Univ. (Austria)). 1982. 13p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702505.

We show the identity of the Eisenbud-Wigner time delay and that of Lavine for potentials V = V1 + V2, V1 approximately 1/'x'sup(1+epsilon), x nabla V1 approximately 1/'x'sup(1+epsilon), V2 approximately 1/'x'sup(2+epsilon) for x → infinity. Finally we show the additivity of time delay for the same class of potentials.

65 PHYSICS RESEARCH

6510 Nuclear Physics

REFER ALSO TO CITATION(S) 49617, 50447

50253 **(CEGB-RD/B—5095N81) UK chemical nuclear data library: a summary of the data available in ENDF/B format.** Davies, B.S.J. (Central Electricity Generating Board, Berkeley (UK). Berkeley Nuclear Labs.). Nov 1981. 94p. NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702392.

The UK Chemical Nuclear Data Committee files have been considerably revised and extended. The files now embrace: fission yields (C31), fission product decay data (UKFPDD-2), activation product decay data (UKPADD-1), and heavy element decay data (UKHEDD-1). The fission yield data is based on Crouch's third round of adjustment and includes yields to isometric states. The decay data files include data on half-life, decay modes, branching ratios and alpha, beta and gamma radiation energies and intensities. The data have all been recommended by the UK Chemical Nuclear Data Committee for use in the UK reactor programme; they are stored on magnetic tape at AERE Harwell, AEE Winfrith and CEGB Berkeley Nuclear Laboratories.

50254 **(DOE/ER/40048—60) Nuclear Physics Laboratory annual report.** (Washington Univ., Seattle (USA). Nuclear Physics Lab.). Apr 1983. Contract AC06-81ER40048. 121p. NTIS, PC A06/MF A01. Order Number DE83015408.

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Progress is described in the following areas: astrophysics and cosmology, nuclear structure and light ion reactions, giant resonances in radiative capture, heavy ion reations, nuclear tests of fundamental symmetries, parity violation in hydrogen, medium energy physics, accelerator mass spectrometry (C-14 and Be-10 radiochronology programs), accelerators and ion sources, magnetic spectrograph/momentum filter, instrumentation and experimental techniques, computers and computing, and the superconducting booster for the University of Washington tandem accelerator. Publications are listed. (WHK)

50255 **(DOE/ER/40081—1) Studies of nuclei far from stability in the A approx. mass region. Progress report, 1 August 1982-30 June 1983.** (Florida Univ., Gainesville (USA). Space Astronomy Lab.). 1983. Contract AS05-82ER40081. 33p. NTIS, PC A03/MF A01. Order Number DE83016434.

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Progress is reported on the following topics: a study of the energy level structure of ^{82}Sr; studies of ^{80}Sr and ^{84}Zr; measurement of g-factors in ^{80}Ge; Coulomb excitation studies of high spin states in ^{246}Cm; a study of the E0, E2, E4, and E6 multipole densities of ^{180}Hf by electron scattering; a portable CAMAC data acquisition system; design and construction of a multiplicity detector for fast neutrons; development and testing of a spectrum analysis pro-

gram; statistics of FSU LINAC operation; and development of a gamma-ray counting station for the new FSU LINAC. (WHK)

50256 **(IAEA-NDS—28) RESPAR3 and RESPAR3ED Libraries. Resonance parameters from BNL-325 (3rd Ed. 1973). Content and format description.** Silva, C.S.A. da; Paviotti Corcuera, R. (International Atomic Energy Agency, Vienna (Austria). Nuclear Data Section). Feb 1979. 7p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83701476.

RESPAR3 and RESPAR3ED contain the resonance parameters from BNL-325 in standard and edited formats respectively. The libraries can be obtained on magnetic tape, free of charge, from the IAEA Nuclear Data Section.

50257 **(IAEA-NDS—29) ENDF/B-V processing programs. Description and operating instructions.** DayDay, N. (International Atomic Energy Agency, Vienna (Austria). Nuclear Data Section). Jul 1980. 19p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83701477.

A description and operating instructions are supplied for the following ENDF/B-V Processing Programs: CHECKER, CRECT, STNDRD, FIZCON, PSYCHE, RESEND, INTER, INTEND, SUMRIZ, PLOTEF, LSTFCV, RIGEL. These programs can be obtained on magnetic tape, free of charge, from the IAEA Nuclear Data Section.

50258 **(IAEA-NDS—39) Summary of ENDF/B pre-processing codes.** Cullen, D.E. (International Atomic Energy Agency, Vienna (Austria). Nuclear Data Section). Dec 1981. 49p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83701479.

This document contains the summary documentation for the ENDF/B pre-processing codes: LINEAR, RECENT, SIGMA1, GROUPIE, EVALPLOT, MERGER, DICTION, CONVERT. This summary documentation is merely a copy of the comment cards that appear at the beginning of each programme; these comment cards always reflect the latest status of input options, etc. For the latest published documentation on the methods used in these codes see UCRL-50400, Vol.17 parts A-E, Lawrence Livermore Laboratory (1979).

50259 **(INIS-mf—8135) Annual report '80.** (Stichting voor Fundamenteel Onderzoek der Materie, Utrecht (Netherlands); Stichting Inst. voor Kernphysisch Onderzoek, Amsterdam (Netherlands)). 1981. 224p. (In Dutch). NTIS (US Sales Only), PC A10/MF A01. Order Number DE83702820.

This document is an annual report from the Foundation for Fundamental Research on Matter (FOM) and the Foundation Institute for Nuclear Physics Research (IKO). The FOM stimulates research in new fields of physics, by the co-ordination of existing research projects and by calling in the help of its institutes and working groups. Furthermore it supports the IKO which has as its task the promotion of fundamental and applied scientific research in the field of nuclear physics and related fields in the Netherlands. The report contains organisational and financial reports and information concerning the personnel. The following FOM institutes/working-communities have submitted separate reports: Nuclear physics, Institute for atomic and molecular physics, Atomic physics, Metals FOM-TNO, Molecular physics, Solid State, Thermonuclear Research and Plasma Physics and High energy physics. Reports are also included from the Special Committee for Theoretical physics, The Special Committee for Technical physics and the Contact Group for technical semi-conductor physics and electronics. Four "trend articles" are also included with the following titles: 'Atomic hydrogen as a gas at low temperatures', 'Negative ion beams', 'Turbulence in plasmas' and 'Nuclear structure described by interacting bosons'. (C.F.).

50260 **(LA—9709-PR) Progress at LAMPF: Clinton P. Anderson Meson Physics Facility. Progress report, January-December 1982.** Allred, J.C. (ed.). (Los Alamos National Lab., NM (USA)). Mar 1983. Contract W-7405-ENG-36. 207p. NTIS, PC A10/MF A01. Order Number DE83013358.

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Research summaries are given under the general headings of nuclear and particle physics, materials science, biomedical research and instrumentation, nuclear chemistry, and theory. Planning for LAMPF II and the LAMPF II experimental program is described. LAMPF accelerator operations and facility and experimental development are detailed. All the active, complete, and planned experiments are tabulated, and publications are listed. (WHK)

50261 **(SUNI—70) Southern Universities Nuclear Institute annual research report for the year ending December 1981.** McMurray, W.R.; Renan, M.J. (eds.). (Southern Universities Nuclear Inst., Faure (South Africa)). 1981. 108p. NTIS (US Sales Only), PC A06/MF A01. Order Number DE83902614.

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The operation of the 5.5-MV Van de Graaff accelerator is reported briefly. Research in the fields of nuclear reactions and structure, nuclear analytical chemistry, atomic physics, solid-state and materials research, medical and life sciences, and industrial and environmental projects are summarized. Activities in data acquisition and processing, accelerators, isotopes, etc. are also reported. (DLC)

50262 **(TU-Inf—05-12-81) Evaluation of nuclear data - objectives, methods and results.** Hermsdorf, D. (Technische Univ., Dresden (German Democratic Republic). Sektion Physik). [nd]. 16p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702395.

An attempt has been made to give a comprehensive survey on the status of nuclear data evaluation achieved at present and the actual problems arising from application. Generally, by continuously increasing nuclear data requirements the evaluation efforts should be strengthend. Only in minor quantities the accuracy demanded can be fulfilled at present. The international cooperation should be re-inforced to avoid diverging data sets recommended for application purposes. A deletion of files which have been proved to be wrong seems to be necessary. From theoretical point of view new practicable models have to be elaborated for multi-step-direct reaction mechanisms to substantiate results obtained by pre-equilibrium models from fundamental physics aspects.

50263 **(UCRL—89382) Radioactive-ion-beam research at Livermore.** Haight, R.C.; Mathews, G.J.; Ward, R.A.; Woosley, S.E. (Lawrence Livermore National Lab., CA (USA)). Jun 1983. Contract W-7405-ENG-48. 26p. (CONF-830786—1). NTIS, PC A03/MF A01. Order Number DE83014872.

From Nuclear Science Advisory Committee (NSAC) long range planning session and NRC physics survey meeting; Pasadena, CA, USA (1 Jul 1983).

The availability of radioactive ion beams represents a major advance in the capability to attack important problems of basic and applied nuclear physics. For the first time we are able to study nuclear reactions on nuclides outside the valley of stability. These nuclides represent about 80% of particle-stable isotopes. Questions of nuclear reaction mechanisms, nuclear properties of bound and continuum states, and basic symmetries for these unstable nuclides can therefore be answered by direct measurement rather than by speculation. The applications of radioactive ion beams are widespread and extensive. In astrophysical studies, nuclear reactions of radioactive ion beams are essential to understanding a wide range of problems in energy generation, nucleosynthesis, neutrino effects, and the implications of gamma-ray astrophysical measurements. In material studies, the implantation of radioactive ions has already seen important use. Well defined beams of these ions will greatly increase the specifity and sensititivity of this technology. Radioactive ion beams may also have significant applications in medical diagnostics and therapy. Finally, standard sources of beta and gamma radiation can be prepared with much greater precision than formerly available.

6511 Experimental Techniques

50264 (LBL—16469) Results obtained using the Plastic Ball. Ritter, H.G.; Gustafsson, H.A.; Gutbrod, H.H. (Lawrence Berkeley Lab., CA (USA); Gesellschaft fuer Schwerionenforschung m.b.H., Darmstadt (Germany, F.R.)). Aug 1983. Contract AC03-76SF00098. 14p. (CONF-830675—5). NTIS, PC A02/MF A01. Order Number DE83016315.

From 6. high energy heavy ion study and 2. workshop on anomalons; Berkeley, CA, USA (28 Jun 1983).

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Single-particle inclusive experiments, and experiments that additionally measure a few correlations like the associated multiplicity, have provided the main contribution to our present understanding of high-energy heavy-ion collisions. The results from those experiments are in overall agreement with calculations of the cascade and hydrodynamical models. In the cascade model the collision of two nuclei is simulated as a cascade of nucleon-nucleon collisions using measured N-N cross sections. The hydrodynamical model, on the other hand, describes the nuclear collision as that of two fluids and makes use of a nuclear equation of state relating thermal and compressional energy densities to pressure. The pressure field dominates the expansion phase and leads to collective flow of the reaction products in a preferred direction. The observation of such effects in inclusive experiments is not well established. Collective effects that manifest themselves in the shape of the event in phase space are expected to be seen best in complete event detectors that measure the final state as exclusively as presently possible by measuring most of the charged particles emitted in the reaction. In addition, those detectors are well suited to test macroscopic concepts such as equilibrium and temperature. Global methods like the sphericity or thrust analysis take into account all the correlations measured in the event and are specially designed to determine the shape of an event in phase space and thus to define a reaction plane. Recent data from the Plastic Ball experiment about the study of nuclear stopping and thermalization and on global analysis are presented.

50265 Lasers in nuclear physics. Feld, M.S. (Massachusetts Inst. of Tech., Cambridge). *Nuclear Science Research Conference Series;* 3: 1-44(1982). (CONF-820428—).

From Conference on lasers in nuclear physics; Oak Ridge, TN, USA (21 Apr 1982).

This paper reviews the laser techniques which ave been developed over the past few years for measuring hyperfine structure of unstable species and for preparation of materials for nuclear physics applications and fundamental studies. Laser techniques for hyperfine structure measurements based on detecting optical photons, atoms and ions, and nuclear radiation are reviewed and compared. Current laser methods for producing polarized samples for nuclear target and beam applications are discussed. Use of laser techniques to study fundamental processes is summarized. The prospects for utilizing laser radiation to alter intrinsic properties of a nucleus and for control of gamma radiation are also reviewed.

50266 Nuclear structure and the atomic spectrum. Redi, O.; Stroke, H.H. *Nuclear Science Research Conference Series;* 3: 45-68(1982). (CONF-820428—).

From Conference on lasers in nuclear physics; Oak Ridge, TN, USA (21 Apr 1982).

Nuclear structure studies with the use of atomic spectroscopy are reviewed. The particular importance of the sensitivity of atomic techniques, which allow work with radioactive atoms, is emphasized. Measurements of nuclear moments and of the distribution of nuclear charge and magnetization through isotope shifts and hfs are described, and interpretations in the light of nuclear models given. Recent advances in accounting for the specific mass shifts are indicated.

6512 Nuclear Properties And Reactions, A=1-5

50267 (DOE/ER/04043—T2) Quasi-free scattering of pions on ^{3} ^{4}He. Whitney, R.R.; Kaelne, J.; McCarthy, J.S.; Minehart, R.C.; Boudrie, R.L.; Davis, J.F.; McClelland, J.B.; Stetz, A. (Virginia Univ., Charlottesville (USA). Dept. of Physics; Los Alamos National Lab., NM (USA); Oregon State Univ., Corvallis (USA). Dept. of Physics). 1982. Contract AS05-76ER04043. 19p. NTIS, PC A02/MF A01. Order Number DE83016349.

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Differential cross sections for ^{3} ^{4}He(π,π') are presented for angles of 60° and 120° at 200 MeV and 120° at 295 MeV. The momentum spectra for the scattered pions are dominated by a peak attributed to quasi-free scattering from individual nucleons. There are significant differences between the scattering on ^{3}He and ^{4}He as well as between the scattering of π^+ and π^- on ^{3}He. The data are compared to a simple model incorporating the free π+N scattering amplitudes. Modifications for the structure and dynamics of the target nucleus are discussed.

50268 (JINR—E-4-82-306) Theory of coupled πNN-NN systems. Machavariani, A.I. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation). 1982. 20p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703418.

On the basis of the deuteron and Δ asobar as a one-particle state, a version of relativistic equations for coupled πNN and NN systems is obtained. It is demonstrated that, if one neglects the non-pole term of the pion-nucleon Green function in the (3.3) resonance region, the three-body equations reduce to a set of equations for the two-body amplitudes of transitions between the πd, NN and NΔ channels.

50269 (SLAC-PUB—3146) Covariant theory with a confined quantum. Noyes, H.P.; Pastrana, G. (Stanford Linear Accelerator Center, CA (USA)). Jun 1983. Contract AC03-76SF00515. 3p. (CONF-830862—2). NTIS, PC A02/MF A01. Order Number DE83014897.

From 10. international conference on few-body problems in physics; Karlsruhe, F.R. Germany (21 Aug 1983).

It has been shown by Lindesay, Noyes and Lindesay, and by Lindesay and Markevich that by using a simple unitary two particle driving term in covariant Faddeev equations a rich covariant and unitary three particle dynamics can be generated, including single quantum exchange and production. The basic observation on which this paper rests is that if the two particle input amplitudes used as driving terms in a three particle Faddeev equation are assumed to be simply bound state poles with no elastic scattering cut, they generate rearrangement collisions, but breakup is impossible.

50270 (ZfK—486) Basic mechanisms of radiative pion capture. Gmitro, M.; Kissener, H.R.; Truoel, P.; Eramzhyan, R.A. (Zentralinstitut fuer Kernforschung, Rossendorf bei Dresden (German Democratic Republic)). Oct 1982. 80p. NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702396.

Recent progress is reviewed in understanding the basic mechanisms, which govern the application of the (π^-,γ) reaction to nuclear structure studies. We use the examples of the few nucleon systems and ^{16}O. New data for ^{3}H(π^-,γ)nn provide the most precise information on the nn scattering parameters at low energies. The relevance of these results for charge symmetry breaking of the NN force is discussed. After developing the formalism to theoretically describe the (π^-,γ) reaction and discussing the role of this probe among the intermediate energy reactions, the ^{16}O(π^-,γ)^{16}N case is used to compare the nuclear response obtained in the unified theory of nuclear reactions to the one obtained under the assumption that resonance dominate. The role of higher nuclear configurations in the response is exposed. Lastly we elaborate on the limitations of the present theories in the light of new experimental data from the meson factories.

6513 Nuclear Properties And Reactions, A=6-19

REFER ALSO TO CITATION(S) 49717, 50270

50271 (CEA-CONF—6597) Few aspects of intermediate energy heavy ion reactions. Guet, C. (CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France)). Oct 1982. 26p. (CONF-820979—9). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83703423.

From International conference on nucleus-nucleus collisions; East Lansing, MI, USA (27 Sep 1982).

Some aspects of reactions induced by intermediate energy heavy ions, with a special emphasis of 85 MeV/nucleon ^{12}C data, are discussed and compared to low energy and relativistic energy features. Transition from mean field to independant nucleon picture is advocated by an increase of nuclear transparency illuminated by reaction cross section estimations. Projectile-like fragment distributions, while demonstrating a typical high energy fragmentation behaviour, exhibit low energy regime distortions. Light fragments, associated to large parallel momentum transfer may result from total explosion. Proton emission is investigated and discussed in terms of opposite models such as thermal equilibrium and nucleon-nucleon scattering. First pion production data are well explained by single nucleon-nucleon inelastic scattering.

50272 (ZfK—487) Radiative pion capture, a probe for nuclear spin densities. Gmitro, M.; Kissener, H.R.; Truoel, P.; Eramzhyan, R.A. (Zentralinstitut fuer Kernforschung, Rossendorf bei Dresden (German Democratic Republic)). Oct 1982. 86p. NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702397.

Successes and failures of trying to interpret recent data on the (π^-,γ) reaction in light nuclei in the framework of the shell model are reviewed. The potential of radiative pion capture as a probe for nuclear spin densities is underlined, using M2 and M1 states as detailed examples. After reporting on the few examples available in heavier than 1p shell nuclei, we conclude with brief reference to inflight capture and an outlook on future experimental possibilities.

6514 Nuclear Properties And Reactions, A=20-38

REFER ALSO TO CITATION(S) 50104, 50272, 50284

50273 (LBL—16175) Subthreshold K^- production in nucleus-nucleus collisions. Shor, A.; Carroll, J.; Barasch, E. (Lawrence Berkeley Lab., CA (USA); California Univ., Los Angeles (USA); California Univ., Davis (USA)). Jun 1983. Contract AC03-76SF00098. 8p. (CONF-830675—4). NTIS, PC A02/MF A01. Order Number DE83015955.

From 6. high energy heavy ion study and 2. workshop on anomalons; Berkeley, CA, USA (28 Jun 1983).

We have measured the production cross section and momentum distribution of K^- produced at 0° in ^{28}Si + ^{28}Si collisions at an energy of 2.1 GeV/nucleon. The K^- spectrum is approximately exponential. The large yield in the subthreshold production of K^- that we observe corresponds to a production rate of $1K^-$ per 50 collisions at impact parameters less than 1f. Productions mechanisms involving collective effects and thermal equilibration are discussed.

6515 Nuclear Properties And Reactions, A=39-58

REFER ALSO TO CITATION(S) 50104, 50264, 50280

50274 Isotope shifts of $6p^2$-6p7p two-photon transitions in stable lead isotopes. Lindgren, I. (Chalmers Tekniska Hoegskola, Goeteborg, Sweden); Matthias, E.; Timmermann, A. *Nuclear Science Research Conference Series;* 3: 101-106(1982). (CONF-820428—).

From Conference on lasers in nuclear physics; Oak Ridge, TN, USA (21 Apr 1982).

Isotope shifts of $6p^2$-6p7p two-photon transitions were measured for stable lead isotopes. To evaluate $\delta < r^2 >$ - values, the change in electronic charge density was calculated using a relativistic self-consistent-field method. The calculations show that the main contribution to the volume shift originates from the contraction of the 6s shell due to reduced screening. The resulting $\delta < r^2 >$ - values agree within the error limits with independent results from muonic and electronix x-ray shifts and with the predictions of the droplet model.

6517 Nuclear Properties And Reactions, A=90-149

REFER ALSO TO CITATION(S) 50155, 50253, 50264

50275 (CEA-CONF—6564) Pionic cross-sections for ^{12}C induced reactions at 85 MeV/N. Guet, C. (CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France)). Jan 1982. 6p. (CONF-820149—8). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703422.

From 20. international meeting on nuclear physics; Bormio, Italy (25 Jan 1982).

In this contribution we report an experiment held at the CERN synchrocyclotron with the 85 A-MeV ^{12}C beam and a preliminary interpretation of the data in terms of a nucleon-nucleon first collision model. Note that in order to illuminate any collective behaviour it would even be preferable to compare the pion production in the ^{12}C-Nucleus reaction to the incoherent sum (internal momenta being taken into account) of nucleon induced reactions such as N + Nucleus → π + anything. Surprisingly enough, to our knowdge no extensive data exist for inclusive pion production in p-Nucleus collision at energies between approximately 140 MeV (absolute threshold) and 300 MeV.

50276 (CRN-PN—82-03) Decay of high angular momentum isomers: ^{149}Dy and ^{216}Ra nuclei. Khazrouni, Sadok. (Strasbourg-1 Univ., 67 (France). Centre de Recherches Nucleaires; Strasbourg-1 Univ., 67 (France)). Apr 1982. 90p. (In French). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83703424.

Some general considerations on the forming and de-excitation of high angular momentum nuclei are given. The experimental equipment employed is then described and analyzed. Discrete high angular momentum states of $^{149}Dy_{93}$ and $^{216}Ra_{128}$ were investigated. Measurements of excitation functions induced by ^9Be beams enable the order of the levels beneath the isomer to be determined. Isomeric states were studied using a pulsed ^{32}S beam. Discrete ^{216}Ra transitions above the isomeric state were also studied.

50277 (IA—1375, pp 27-28) Preliminary comparison between ENDF/B-V evaluation and Petten measurements of the capture cross sections of Tc-99 and Rh-103. Gur, Y.; Yiftah, S. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

50278 (IAEA-R—2499-F) Charged particle cross-section data and their systematization. Final report for the period 1 November 1979 - 30 November 1981. Nassif, S. (International Atomic Energy Agency, Vienna (Austria)). Jul 1982. 44p. NTIS (US Sales Only), PC A05/MF A01. Order Number DE83703425.

The reaction cross-sections and the thick target yields of (α,αxn) and (α,xn), induced by the alpha particles from the Buenos Aires 60 inch synchrocyclotron for Cu, Y, Zr, Rh, Te, Ta, Au and Pb were obtained. The "stocked foil" method was applied. The "nuclear spin density" parameter was determined using a phenomenological approximation from the cross section data for $^{181}Ta(\alpha,n)$ reaction producing isomeric pairs of sup(184m)Re and sup(184g)Re. The systematic behaviour of the present result and the results of other authors were demonstrated.

50279 (JINR-R—4-82-740) Effect of phonon interaction on the ground state of even-even spherical nuclei. Nguen Din' Dang; Ponomarev, V.Yu. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics). 1982. 10p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703419.

The equations for calculating the energy and the structure of the excited states with the wave function containing one- and two-phonon components are obtained. The phonon correlations in the ground state of the nucleus due to the interaction of the phonon modes excitation are taken into account. The numerical estimations of the phonon correlations influence on the energy of the lowest excited states are given.

50280 **(LBL—16110) 4π data of relativistic nuclear collisions.** Gutbrod, H.H.; Gustafsson, H.A.; Kolb, B. (Gesellschaft fuer Schwerionenforschung m.b.H., Darmstadt (Germany, F.R.); Lawrence Berkeley Lab., CA (USA)). May 1983. Contract AC03-76SF00098. 7p. (CONF-830674—3). NTIS, PC A02/MF A01. Order Number DE83016002.

From 6. international Balaton topical conference on high energy nuclear physics; Balatonfured, Hungary (6 Jun 1983).

During the past two years, complete events of relativistic nuclear collisions are being studied with the Plastic Ball, the first electronic nonmagnetic particle-identifying 4π spectrometer. It is well suited to handle the large multiplicities in these reactions and allows collection of data at a rate sufficient to make further software selections to look at rare events. The analysis of the data follows various lines covering topics like thermalization, stopping or transparency, cluster-production mechanism (--can it tell entropy), search for collective flow through various global analyzing methods that allow determination of the scattering plane, projectile fragmentation (--is there a bounce-off), pion distribution, two-particle correlations: Hanbury-Brown Twiss, and excited nuclear states (--nucleosynthesis at the freezeout point or from chemical equilibrium). We will cover in this contribution only two subjects: stopping and thermalization and cluster production.

50281 **(LBL—16372) Phenomenology of deep-inelastic processes.** Moretto, L.G. (Lawrence Berkeley Lab., CA (USA); Max-Planck-Institut fuer Kernphysik, Heidelberg (Germany, F.R.)). Mar 1983. Contract AC03-76SF00098. 21p. (CONF-830340—3). NTIS, PC A02/MF A01. Order Number DE83016622.

From International conference on heavy-ion physics and nuclear physics; Catania, Italy (21 Mar 1983).

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The field of heavy-ion deep-inelastic reactions is reviewed with particular attention to the experimental picture. The most important degrees of freedom involved in the process are identified and illustrated with relevant experiments. Energy dissipation and mass transfer are discussed in terms of particles and/or phonons exchanged in the process. The equilibration of the fragment neutron-to-proton ratios is inspected for evidence of giant isovector resonances. The angular momentum effects are observed in the fragment angular distributions and the angular momentum transfer is inferred from the magnitude and alignment of the fragments spins. The possible sources of light particles accompanying the deep-inelastic reactions are discussed. The use of the sequentially emitted particles as angular momentum probes is illustrated. The significance and uses of a thermalized component emitted by the dinucleus is reviewed. The possible presence of Fermi jets in the prompt component is shown to be critical to the justification of the one-body theories.

50282 **Investigation of intruder states in ^{114}Cd.** Mheemeed, A.; Valentin, J. (Institut Max von Laue - Paul Langevin, 38 - Grenoble (France)); Schreckenbach, K.; Barreau, G.; Egidy, T. von (Technische Univ. Muenchen (Germany, F.R.)); Faust, H.R.; Boerner, H.G.; Brissot, R.; Stelts, M. (Brookhaven National Lab., Upton, NY (USA)). pp 190-191 of Neutron-capture gamma-ray spectroscopy and related topics 1981. Egidy, T. von; Goennenwein, F.; Maier, B. (eds.). Bristol (UK); Institute of Physics (1982). (CONF-810920—).

From 4. international symposium on neutron-capture gamma-ray spectroscopy and related topics; Grenoble, France (7 Sep 1981).

The level structure of ^{114}Cd has been investigated via the (n,γ) reaction up to an excitation energy of 3 MeV. The levels with their decay properties indicate strong perturbations of the vibrational excitations by deformed intruder states.

6518 Nuclear Properties And Reactions, A=150-189

50283 (ARL/TR—050, pp 111-115) **Branching ratios in the α-decay of the heavy elements.** Johnston, P.N.; Wise, K.N.; Moroney, J.R.; Burns, P.A. Jan 1983. NTIS (US Sales Only), PC A08/MF A01.

In Annual review of research projects 1981.

There is a need for both high resolution and high efficiency in the accurate determination of branching ratios in alpha decay. The objective of the study was to develop a method based on silicon surface barrier detectors for the determination of branching ratios to an accuracy of better than 1%. Three distribution free methods were investigated. All relied on the observation that the count contributed by the higher energy peak under the low energy one is a monotonic function of energy when the peaks are well separated. ^{234}U and ^{238}Pu were used for the investigations.

6519 Nuclear Properties And Reactions, A=190-219

REFER ALSO TO CITATION(S) 50276, 50283

50284 **(ANU-P—833) Fission barriers of Pb nuclei at high angular momentum.** Hinde, D.J.; Newton, J.O.; Leigh, J.R.; Charity, R.J. (Australian National Univ., Canberra. Dept. of Nuclear Physics). Dec 1982. 32p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83703421.

Fission and evaporation residue excitation functions have been measured after the nuclei $^{192\ 195\ 198\ 200}$Pb were formed by the fusion of $^{28\ 30}$Si with $^{164\ 167\ 170}$Er. The fission probabilities extracted were fitted using the rotating liquid drop/statistical model codes ORNL ALICE and MBII. The range of values of the mass asymmetry, (N-Z)/A, of the fissioning systems allows some restrictions to be placed on the value of the surface asymmetry parameter Ksub(s) used in the liquid drop model, despite the many uncertainties and approximations in the data analysis.

50285 (INDC(CCP)—177/L, pp 21-25) **Study of the possibility of excitation of isobaric analogue states in the ^{207}Pb(np) reaction.** Belovitskij, G.E.; Preobrazhenskij, Yu.A.; Presnyak, O.S. May 1982. NTIS (US Sales Only), PC A04/MF A01.

In Translation of selected papers published in Nuclear Constants, Volume 1(40) Moscow (1981).

In the experiments described in this paper we studied neutron-induced excitation of IAS in the ^{208}Pb compound nucleus in the ^{207}Pb(np) reaction (Esub(n) = 15.3-19.0 MeV).

50286 **Nuclear structure of ^{195}Pt.** Warner, D.D. (Institut Max von Laue - Paul Langevin, 38 - Grenoble (France); Brookhaven National Lab., Upton, NY (USA)); Boerner, H.G.; Barreau, G. (Institut Max von Laue - Paul Langevin, 38 - Grenoble (France)); Casten, R.F.; Stelts, M.L. (Brookhaven National Lab., Upton, NY (USA)). pp 238-239 of Neutron-capture gamma-ray spectroscopy and related topics 1981. von Egidy, T.; Goennenwein, F.; Maier, B. (eds.). Bristol (UK); Institute of Physics (1982). (CONF-810920—).

From 4. international symposium on neutron-capture gamma-ray spectroscopy and related topics; Grenoble, France (7 Sep 1981).

The level scheme of ^{195}Pt has been studied using the ^{194}Pt(n,γ)^{195}Pt reaction. Primary γ-ray spectra following average resonance capture (ARC) with mean neutron energies of 2 and 24 keV were obtained with a three-crystal pair spectrometer system (Stelts and Chrien, 1978) at Brookhaven National Laboratory. Secondary γ rays were observed with the curved crystal spectrometers GAMS 1, 2 and 3 (Koch et al., 1980) at the high flux reactor of the Institute Laue-Langevin. These results were combined with existing information from β decay (Jansen et al., 1973) and single neutron transfer studies (Yamazaki and Sheline, 1976) to construct the level scheme of ^{195}Pt.

6520 Nuclear Properties And Reactions, A=220 And Above

REFER ALSO TO CITATION(S) 50253, 50253, 50283

50287 (ARL/TR—050, pp 95-100) **Fluorescence yield and Coster-Kronig transition probability for the L_2 subshell of Ra, Th, Pa, U, Np and Pu.** Johnston, P.N.; Moroney, J.R.; Burns, P.A. Jan 1983. NTIS (US Sales Only), PC A08/MF A01.

In Annual review of research projects 1981.

Within the range of atomic number 88 to 94, the Coster-Kronig transitions L_2-L_3M_4 and L_2-L_3M_5 become energetically available causing a large change in the probability of Coster-Kronig transitions between the L_2 and L_3 subshells (f_{23}) and smaller changes in the L_2 subshell fluorescence yield (ω). In order to determine f_{23} and ω experimentally, it is essential that the chosen method gives explicit definition of the distribution of vacancies in all three L subshells. The nuclides under study decay predominantly to excited states of low energy in the daughter nuclei, which tend to de-excite by electromagnetic transitions. The transitions are highly internally converted in the L subshells. The distribution of vacancies is determined mainly by the strengths of the α branches and the internal conversion coefficients for the L subshells.

50288 (ARL/TR—050, pp 101-102) **Measurement of absolute emission rates of L X-rays.** Burns, P.A.; Johnston, P.N.; Moroney, J.R. Jan 1983. NTIS (US Sales Only), PC A08/MF A01.

In Annual review of research projects 1981.

Many radionuclides of high atomic mass emit L x-rays from internal conversion as their only substantial photon emissions. It is hoped that by making careful measurements of the X and γ-ray intensities of a number of actinides, nuclides more suitable as standards in the calibration of low energy photon spectrometers than Am-241 might be found. Thorium 230, uranium 234, neptunium 237, plutonium 238, americium 241 and curium 244 were selected in order to determine the absolute emission rates of their L x-rays by alpha-particle gated L x-ray spectrometry.

50289 **(DOE/ER/40048—63-L3) Fusion and fission properties of rapidly rotating nuclei $^{40}Ar + {}^{238}U \rightarrow {}^{278}110$ at E/sub cm/ = 291 MeV.** Lesko, K.T. (Washington Univ., Seattle (USA)). 1983. Contract AC06-81ER40048. 195p. NTIS, PC A09/MF A01. Order Number DE83015736.

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Coincident fission fragments were detected to study the complete capture reaction, $^{40}Ar + {}^{238}U \rightarrow {}^{278}110 \rightarrow f$, at E/sub cm/ = 291 MeV (E/sub lab/ = 340 MeV). The detection system had a high efficiency to detect and subsequently veto events showing evidence of incomplete momentum transfer. The angular distribution of fission fragments was obtained between the center-of-mass angles of 119° and 164°. The mass distributions of the fission fragments were also obtained for these angles. One non-coincident measurement made at θ/sub cm/ = 43.7° confirmed the symmetry of the angular distribution about 90°. This study is distinguished from other recent studies by the use of a novel veto technique. This is the first measurement which has not been compromised by contamination with incomplete momentum-transfer reactions due to either pre-equilibrium emission or fission following deeply inelastic scattering. This is also the first investigation which reports detailed angular distributions with a majority (~ 90%) of the capture cross section leading to nuclei having vanishing fission barriers. The rotating liquid-drop-model parameters were extracted from the data. The RLDM shapes along with statistical fission models, when applied to all partial waves, fail to reproduce the angular distributions. We interpret the angular distributions by applying statistical-equilibrium models and RLDM shapes for the nonvanishing fission-barrier partial waves and by assuming that the vanishing fission-barrier partial-wave contribution is given by 1/sin θ. A 1/sin θ distribution is expected for a system which has not reached complete statistical equilibrium and maintains a memory of its entrance channel, with the fission fragments being emitted in the reaction plane defined by the initial contact.

50290 (EPRI-NP—2855, pp 5.1-5.13) **Effect of resonance interference between different nuclides on the resonance integral and its variation with fuel temperature.** Mizuta, H.; Yamamoto, M.; Iwamoto, T. (NAIG Nuclear Research Lab., Kawasaki-shi, Japan). Feb 1983. NTIS, PC A99/MF A01. (CONF-820566—).

From Thermal reactor benchmark calculations, techniques, results and applications seminar; Upton, NY, USA (17 May 1982).

Only limited number of studies have been done concerning the effect of resonance interference on the resonance integral I and its variation ΔI with fuel temperature T, inspite of its possible importance. Nuclides studied so far are Th-232 in ThO_2 rod, U-238/Cs-133 in BWR fuel rod, homogeneous mixtures of U-238/U-235/Pu-239, U-Pu chains/FP's (fission products) and Th-U chains/FP's. General conclusions seem to be that the effect of the major nuclide B (e.g., U-238, Pu-240) on the resonance integral IB of the minor nuclide B (e.g. U-235, Pu-239, FP's) is sometimes fairly large, while the presence of the nuclide B scarcely affect the resonsance integral IA of the nuclide A and its variation ΔIA with fuel temperature. The above conclusions, however, were made a little obscure because of, the confusion between the competitive effect and the overlap effect of resonance absorptions, and the complication of the phenomena involved. In the present paper, the problem is simplified, still preserving the essence of the resonance interference mechanism in a heterogeneous system. Definitions of IA and IB, which contain only the overlap effects, are given for a system consisting of resonance nuclides A and B, and other non-resonance nuclides. Using the above IA and IB, the quantitative evaluations of the overlap effects are given for a typical BWR lattice. Combinations of resonance levels considered are the main levels of Pu-240, U-238 (nuclide A) and overlapping levels of Rh-103, Cs-133, Sm-150, Gd-155 and Gd-157 (nuclide B). Gadolinium isotopes are included here because 2 to 4% Gd_2O_3 is used in BWR fuel rods as burnable absorber.

50291 (INDC(CCP)—177/L, pp 35-38) **0.4-1.3 MeV neutron-induced fission cross-section for ^{244}Cm.** Vorotnikov, P.E.; Kozlov, L.D.; Molchanov, Yu.D.; Shuf, G.A. (Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Moscow. Inst. Atomnoj Ehnergii). May 1982. NTIS (US Sales Only), PC A04/MF A01.

In Translation of selected papers published in Nuclear Constants, Volume 1(40) Moscow (1981).

In their experiments, the authors employed the method of measuring σsub(f)(Esub(n)) of transuranic elements with a pulsed electrostatic accelerator using nanogram quantities (an amount smaller by a factor of approx. 10^4 than was required earlier) of the substance. The purpose of the present work is not only to derive the dependence σsub(f)(Esub(n)) for ^{244}Cm, but also to verify this method under the actual conditions of a physical experiment. The paper gives the measurements of the 400-1300 keV mono-energetic-neutron-induced fission cross-section for ^{244}Cm and shows that the method developed is suitable for fission cross-section measurements with nanogram quantities of isotopes with high spontaneous fission activity.

50292 (INDC(CCP)—178/L) **Energy dependence of the average number of prompt neutrons resulting from the neutron fission of U236.** Malinovsky, V.V.; Vorob'eva, V.G.; Kuz'minov, B.D.; Piksajkin, V.M.; Semenova, N.N. (International Atomic Energy Agency, Vienna (Austria). International Nuclear Data Committee). May 1982. 13p. (CONF-811070—8-Trans.). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703426.

From IAEA advisory group meeting on nuclear data for radiation damage and safety; Vienna, Austria (12 Oct 1981).

The paper gives the numerical results of measurements of the average number of prompt neutrons per fission, ν-barsub(p), from neutron-induced fission of ^{236}U in the 0.8 - 6.0 MeV range. An analysis of corrections and errors is given and a curve is recommended for ν-barsub(p) as a function of neutron energy. The estimated measurement accuracy is approximately 1%.

50293 (LBL—15894) Application of alpha spectrometry to the discovery of new elements by heavy-ion-beam bombardment. Nitschke, J.M. (Lawrence Berkeley Lab., CA (USA)). May 1983. Contract AC03-76SF00098. 28p. (CONF-830539—3). NTIS, PC A03/MF A01. Order Number DE83015996.

From International meeting for radionuclide metrology - alpha particle spectrometry and low level measurement; Harwell, UK (10 May 1983).

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Starting with polonium in 1898, α-spectrometry has played a decisive role in the discovery of new, heavy elements. For even-even nuclei, α-spectra have proved simple to interpret and exhibit systematic trends that allow extrapolation to unknown isotopes. The early discovery of the natural α-decay series led to the very powerful method of genetically linking the decay of new elements to the well-established α-emission of daughter and granddaughter nuclei. This technique has been used for all recent discoveries of new elements including $Z = 109$. Up to mendelevium ($Z = 101$), thin samples suitable for α-spectrometry were prepared by chemical methods. With the advent of heavy-ion accelerators new sample preparation methods emerged. These were based on the large momentum transfer associated with heavy-ion reactions, which produced energetic target recoils that, when ejected from the target, could be thermalized in He gas. Subsequent electrical deposition or a He-jet technique yielded samples that were not only thin enough for α-spectroscopy, but also for α- and β-recoil experiments. Many variations of these methods have been developed and are discussed. For the synthesis of element 106 an aerosol-based recoil transport technique was devised. In the most recent experiments, α-spectrometry has been coupled with the magnetic analysis of the recoils. The time from production to analysis of an isotope has thereby been reduced to 10^{-6} s; while it was 10^{-1} to 10^{0} s for He-jets and 10^{1} to 10^{3} s for rapid chemical separations. Experiments are now in progress to synthesize super heavy elements (SHE) and to analyze them with these latest techniques. Again, α-spectrometry will play a major role since the expected signature for the decay of a SHE is a sequence of α-decays followed by spontaneous fission.

50294 (LBL—16249) Actinide production in the reaction of heavy ions with curium-248. Moody, K.J. (Lawrence Berkeley Lab., CA (USA)). Jul 1983. Contract AC03-76SF00098. 210p. NTIS, PC A10/MF A01. Order Number DE83016705.

Portions are illegible in microfiche products; Thesis.

Chemical experiments were performed to examine the usefulness of heavy ion transfer reactions in producing new, neutron-rich actinide nuclides. A general quasi-elastic to deep-inelastic mechanism is proposed, and the utility of this method as opposed to other methods (e.g. complete fusion) is discussed. The relative merits of various techniques of actinide target synthesis are discussed. A description is given of a target system designed to remove the large amounts of heat generated by the passage of a heavy ion beam through matter, thereby maximizing the beam intensity which can be safely used in an experiment. Also described is a general separation scheme for the actinide elements from protactinium ($Z=91$) to mendelevium ($Z=101$), and fast specific procedures for plutonium, americium and berkelium. The cross sections for the production of several nuclides from the bombardment of ^{248}Cm with ^{18}O, ^{86}Kr and ^{136}Xe projectiles at several energies near and below the Coulomb barrier were determined. The results are compared with yields from ^{48}Ca and ^{238}U bombardments of ^{248}Cm. Simple extrapolation of the product yields into unknown regions of charge and mass indicates that the use of heavy ion transfer reactions to produce new, neutron-rich above-target species is limited. The substantial production of neutron-rich below-target species, however, indicates that with very heavy ions like ^{136}Xe and ^{238}U the new species ^{248}Am, ^{249}Am and ^{247}Pu should be produced with large cross sections from a ^{248}Cm target. A preliminary, unsuccessful attempt to isolate ^{247}Pu is outlined. The failure is probably due to the half life of the decay, which is calculated to be less than 3 minutes. The absolute gamma ray intensities from ^{251}Bk decay, necessary for calculating the ^{251}Bk cross section, are also determined.

50295 Resolved resonance parameters for ^{238}U from 4 to 6 keV. Olsen, D.K.; Meszaros, P.S. (Oak Ridge National Laboratory, Engineering Physics Division, P.O. Box X, Oak Ridge, Tennessee 37830). *Nuclear Science and Engineering;* **83**: No. 1, 174-180(Jan 1983).

Neutron widths for 145 resonances from 4 to 6 keV are reported from a least-squares shape analysis of the Oak Ridge Electron Linear Accelerator 150-m flight path, four-sample ^{238}U transmission data. The resultant s-wave strength function from 4 to 6 keV is found to be substantially smaller than that from 0 to 4 keV.

6530 Nuclear Theory

REFER ALSO TO CITATION(S) 50268, 50269

50296 (CRN-PN—82-19) Heavy ion-light particle angular correlations following deeply inelastic collisions. Strazzeri, A. (Strasbourg-1 Univ., 67 (France). Centre de Recherches Nucleaires). 1982. 17p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703415.

Approximate theoretical expressions are presented for the equilibrium and pre-equilibrium parts of the b-c angular correlations for a sequential three-body reaction X(a,b)Y(c)Z, under the hypothesis that the nucleus Y is highly excited to levels that lie in the continuum region. Semiclassical formulae for the equilibrated and non-equilibrated parts of the in-plane b-c differential multiplicity are given. It is also outlined how a crude estimate of the decay times can be obtained.

50297 (IC—82/83) Geometrical relations for potentials obtained by folding density dependent interactions. Srivastava, D.K. (International Centre for Theoretical Physics, Trieste (Italy)). Jul 1982. 12p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703417.

Geometrical relations between density distributions and the potentials obtained by folding these with density dependent forces are derived. Empirical observations regarding the equivalent sharp radii of the phenomenological potentials and the target mass dependence of the effective projectile-nucleon interaction are explained in terms of the diffuseness of the density distribution of the target and the density dependence of the interaction.

50298 (IC—82/214) Angular distributions in pre-equilibrium reactions. Chatterjee, A.; Gupta, S.K. (International Centre for Theoretical Physics, Trieste (Italy)). Oct 1982. 25p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83703416.

A new model is proposed for calculating angular distributions in preequilibrium reactions. In this model, as in the model of Feshbach et al. the system consisting of target plus projectile initially branches into two sets of states with either no particle in the continuum (multistep compound states) or with at least one particle in the continuum (multistep direct states). The two chains of states are treated independently by solving two sets of master equations. The multistep compound emission is assumed to be isotropic while the angular distribution of the multistep direct emission is described using the fast particle model of Mantzouranis et al. The angular distributions for 14.6 MeV neutrons calculated using this model are found to be in better agreement with the data than the fast particle model.

50299 (LBL—15838) Transport description of damped nuclear reactions. Randrup, J. (Lawrence Berkeley Lab., CA (USA)). Apr 1983. Contract AC03-76SF00098. 45p. (CONF-8304104—3). NTIS, PC A03/MF A01. Order Number DE83016605.

From Nordic winter school; Hemsedal, Norway (1 Apr 1983).

Part I is an elementary introduction to the general transport theory of nuclear dynamics. It can be read without any special knowledge of the field, although basic quantum mechanics is required for the formal derivation of the general expression for the transport coefficients. The results can also be used in a wider context than the present one. Part II gives the student an up-to-date

orientation about recent progress in the understanding of the angular-momentum variables in damped reactions. The emphasis is here on the qualitative understanding of the physics rather than the, at times somewhat tedious, formal derivations. (WHK)

50300 **(LBL—15877) Statistical calculation of complete events in medium-energy nuclear collisions.** Randrup, J. (Lawrence Berkeley Lab., CA (USA)). Apr 1983. Contract AC03-76SF00098. 17p. (CONF-8304104—2). NTIS, PC A02/MF A01. Order Number DE83015951.

From Nordic winter school; Hemsedal, Norway (1 Apr 1983).

This lecture presents the essential tools for formulating a statistical model for the nuclear disassembly process. We consider the quick disassembly (explosion) of a hot nuclear system, a so-called source, into multifragment final states, which compete according to their statistical weight. First some useful notation is introduced. The expressions for exclusive and inclusive distributions are given and the factorization of an exclusive distribution into inclusive ones is carried out. In turn, the grand canonical approximation for one-fragment inclusive distributions is introduced. Finally, it is outlined how to generate a statistical sample of complete final states. On this basis, a model for statistical simulation of complete events in medium-energy nuclear collisions has been developed.

50301 **(SLAC-PUB—3147) Minimal unitary (covariant) scattering theory.** Lindesay, J.V.; Markevich, A. (Stanford Linear Accelerator Center, CA (USA)). Jun 1983. Contract AC03-76SF00515. 3p. (CONF-830862—3). NTIS, PC A02/MF A01. Order Number DE83014896.

From 10. international conference on few-body problems in physics; Karlsruhe, F.R. Germany (21 Aug 1983).

In the minimal three particle equations developed by Lindesay the two body input amplitude was an on shell relativistic generalization of the non-relativistic scattering model characterized by a single mass parameter μ which in the two body (m + m) system looks like an s-channel bound state ($\mu < 2m$) or virtual state ($\mu > 2m$). Using this driving term in covariant Faddeev equations generates a rich covariant and unitary three particle dynamics. However, the simplest way of writing the relativisitic generalization of the Faddeev equations can take the on shell Mandelstam parameter $s = 4(q^2 + m^2)$, in terms of which the two particle input is expressed, to negative values in the range of integration required by the dynamics. This problem was met in the original treatment by multiplying the two particle input amplitude by $\Theta(s)$. This paper provides what we hope to be a more direct way of meeting the problem.

50302 **Current perspectives on statistical models of nuclear reactions.** Lynn, J.E. (UKAEA Atomic Energy Research Establishment, Harwell; Los Alamos Scientific Lab., NM (USA)). pp 267-292 of Neutron-capture gamma-ray spectroscopy and related topics 1981. von Egidy, T.; Goennenwein, F.; Maier, B. (eds.). Bristol (UK); Institute of Physics (1982). (CONF-810920—).

From 4. international symposium on neutron-capture gamma-ray spectroscopy and related topics; Grenoble, France (7 Sep 1981).

A review is given of the development of the statistical theory of nuclear reactions from its inception as a method for estimating cross-sections in the almost complete absence of information on the 'internal mechanisms of the compound nuclear system, to its present state as a precise tool for handling the properties of the large numbers of quantum levels involved in a reaction and as a means to provide estimates of nuclear data for the purposes of technology. The following areas of application are investigated: nuclear level densities, transmission coefficients, fluctuations in level widths, width correlations and direct reactions and level spacing fluctuations.

50303 **Distribution of radiative strength and relations with collective excitations.** Castel, B. (Queen's Univ., Kingston, Ontario (Canada). Dept. of Physics; Oak Ridge National Lab., TN (USA)). pp 293-297 of Neutron-capture gamma-ray spectroscopy and related topics 1981. von Egiddy, T.; Goennenwein, F.; Maier, B. (eds.). Bristol (UK); Institute of Physics (1982). (CONF-810920—).

From 4. international symposium on neutron-capture gamma-ray spectroscopy and related topics; Grenoble, France (7 Sep 1981).

The potential of fast neutron capture reactions as probes of collective strength distribution is discussed. Conceptual problems associated with collective distribution other than El are also examined.

50304 **Self-consistent theory of hadron-nucleus scattering. Application to pion physics.** Johnson, M.B. (Los Alamos National Lab., NM (USA)). pp 412-440 of From nuclei to particles. Molinari, A. (ed.). Amsterdam (Netherlands); North-Holland Publ. Co. (1981). (CONF-8006263—).

From International school of physics enrico fermi - from nuclei to particles; Varenna, Italy (23 Jun 1980).

The first part of this set of two seminars will consist of a review of several of the important accomplishments made in the last few years in the field of pion-nucleus physics. Next I discuss some questions raised by these accomplishments and show that for some very natural reasons the commonly employed theoretical methods cannot be applied to answer these questions. This situation leads to the idea of self-consistency, which is first explained in a general context. The remainder of the seminars are devoted to illustrating the idea within a simple multiple-scattering model for the case of pion scattering. An evaluation of the effectiveness of the self-consistent requirment to produce a solution to the model is made, and a few of the questions raised by recent accomplishments in the field of pion physics are addressed in the model. Finally, the results of the model calculation are compared to experimental data and implications of the results discussed.

6540 Radiation And Shielding Physics

REFER ALSO TO CITATION(S) 49852

50305 (ARL/TR—050, pp 20-26) **X-ray attenuation coefficients.** Martin, L.J.; Mika, J.F. Jan 1983. NTIS (US Sales Only), PC A08/MF A01.

In Annual review of research projects 1981.

The theory, application and measurement of x-ray attenuation coeefficients are discussed.

50306 (ARL/TR—050, pp 49-50) **Lead equivalence of plate glass for diagnostic x-rays.** Young, B.F.; Morris, N.D. Jan 1983. NTIS (US Sales Only), PC A08/MF A01.

In Annual review of research projects 1981.

The effectiveness of plate glass as a radiation protection barrier was determined. For x ray energies between 80 and 140 kVp, the lead equivalence of plate glass is energy independent, but below 80 kVp there is an apparent dependence. A thickness of plate glass of 25 mm for radiation energies between 80 and 140 kVp is equivalent to lead of .3mm thickness. There could be a limited application for the use of plate glass in viewing panels.

50307 **(DOE/ER/03342—11) Low-temperature and neutron-physics studies. Progress report, July 1982-June 1983.** (Massachusetts Inst. of Tech., Cambridge (USA)). Jul 1983. Contract AC02-76ER03342. 6p. (COO—3342-11). NTIS, PC A02/MF A01. Order Number DE83016137.

Experimental and theoretical studies of the neutron-diffraction group at the MIT Research Reactor have concentrated during the past year in areas of neutron interferometry and fundamental diffraction by crystals. Experiments have been performed which demonstrate directly the existence of an anomalously low effective mass for neutrons while being diffracted by a crystal. The experiment consists of applying a transverse force (through the agency of a magnetic field gradient) to the neutrons and observing the change of trajectory. Deflection effects over five orders of magnitude larger than in normal Stern-Gerlach deflection are measured as expected from earlier theoretical analysis. The existence of both positive and negative mass groups is also to be expected and experiments to demonstrate this are in progress. Theoretical analysis has continued on various topics including (a) study of phase perturbations on neutrons caused by the presence of an effective mass in the crystal when a Coriolis force is present, (b) evaluation of limits on

possible medium-range interactions between hadrons and (c) the existence of a coupling between the gravitational interaction and other neutron interactions as would be evidenced in interferometry. Preliminary observations are reported on the presence of simultaneous diffraction of neutrons through a crystal and mirror surface reflection.

50308 **(IAEA-NDS—36) SPOTS4. Group data library and computer code, preparing ENDF/B-4 data for input to LEOPARD.** Kim, J.D.; Lee, J.T. (International Atomic Energy Agency, Vienna (Austria). Nuclear Data Section). Sep 1981. 24p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83701478.

The magnetic tape SPOTS4 contains in file 1 a data library to be used as input to the SPOTS4 program which is contained in file 2. The data library is based on ENDF/B-4 and consists of two parts in TEMPEST format (246 groups) and MUFT format (54 groups) respectively. From this library the SPOTS4 program produces a 172 + 54 group library for LEOPARD input. A copy of the magnetic tape is available from the IAEA Nuclear Data Section.

50309 **(ND-R—467(S)Pt.2) Small-angle neutron-scattering experiments. Pt.2. Use of the Harwell small-angle scattering spectrometer.** Hardy, A.D.; Thomas, M.W.; Rouse, K.D. (UKAEA Risley Nuclear Power Development Establishment). Apr 1981. 50p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702518.

A brief introduction to the technique of small-angle neutron scattering is given. The layout and operation of the small-angle scattering spectrometer, mounted on the AERE PLUTO reactor, is also described. Results obtained using the spectrometer are presented for three materials (doped uranium dioxide, Magnox cladding and nitrided steel) of interest to Springfields Nuclear Power Development Laboratories. The results obtained are discussed in relation to other known data for these materials.

50310 **Heterogeneity effects in neutron transport computations.** Gelbard, E.M. (Argonne National Lab., IL). pp 177-205 of Numerical solution of partial differential equations-III, SYNSPADE 1975. Hubbard, B. (ed.). New York, NY; Academic Press Inc. (1976). (CONF-750545—).

From Symposium on the numerical solution of partial differential equations; College Park, MD, USA (19 May 1975).

Two types of heterogeneity effects in nuclear reactors are considered. First, certain singularities in the solution of the neutron transport equation, induced by heterogeneities, are briefly described. Second, the effect of heterogeneities on neutron leakage rates, and consequently on effective diffusion coefficients, is discussed. 12 references.

50311 **Numerical analysis of the neutron transport equation.** Kellog, R.B. (Univ. of Maryland, College Park). pp 321-347 of Numerical solution of partial differential equations-III, SYNSPADE 1975. Hubbard, B. (ed.). New York, NY; Academic Press Inc. (1976). (CONF-750545—).

From Symposium on the numerical solution of partial differential equations; College Park, MD, USA (19 May 1975).

Regularity results for solutions of the transport equation are surveyed, and some numerical methods for solving the equation are discussed. Emphasis is on the questions of theoretical numerical analysis that arise, and a new iterative method for solving transport problems is formulated. (GHT)

6550 Medical Physics

REFER ALSO TO CITATION(S) 49966

50312 **(INIS-mf—8150) Radionuclide measurements on a phantom with variable body thickness and homogeneously distributed radioactivity. Study of quantitative scintigraphy using Iodine-131.** Ruoff, F.E. (Tuebingen Univ. (Germany, F.R.). Medizinische Fakultaet). 1980. 30p. (In German). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702792.

Thesis.

In this study, the attempt has been made to verify further attenuation corrections for non-uniform organs, especially of tubular shape, with homogeneous distribution of radioactivity. The theoretical verification showed that only the mean transmission or absorption factor, respectively, and the mean thickness of the organ are units of importance. The radionuclide measurements have been carried out on a Siemens Scintimat 2, using J-131. The artificial organ used for this purpose has been of tubular shape, representing the conditions of a non-uniform body organ. The mean transmission factor can be determined by transmission measurements with and without an object. The mean thickness of the organ (tube) can be determined by dividing the cross-sectional surface by the scanning pathway. Thus the correction factor can be derived from these two units and the given attenuation coefficient.

50313 **(JAERI-M—82-035) Numerical calculation methods relating to hybrid lognormal distributions.** Kumazawa, S.; Shimazaki, J.; Numakunai, T. (Japan Atomic Energy Research Inst., Tokyo). Apr 1982. 67p. (In Japanese). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702446.

This report presents numerical calculation methods and computer programs related to hybrid lognormal distributions, which are applied to occupational exposure analysis. These are (1) an estimation of three parameters of hybrid lognormal distributions, (2) calculations of distribution function, percentile, median and mode of the distribution, (3) calculations of moments, mean, variance, geometric mean and geometric standard deviation, and (4) calculations of distribution function, percentile, median and mode of the moment distributions. All computer programs are in the form of subroutines or function subprograms and form a complete program package for hybrid lognormal distributions, including auxiliary programs required. The program package facilitates the estimation of parameters of hybrid lognormal distributions from the observations and calculations of various statistical characteristics to describe the individual dose distributions and collective dose distributions as a function of individual dose.

50314 **(JAERI-M—82-040) Translation of ARAC computer codes.** Takahashi, K.; Chino, M.; Honma, T.; Ishikawa, H.; Kai, M.; Imai, K.; Asai, K. (Japan Atomic Energy Research Inst., Tokyo). May 1982. 83p. (In Japanese). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702448.

In 1981 we have translated the famous MATHEW, ADPIC and their auxiliary computer codes for CDC 7600 computer version to FACOM M-200's. The codes consist of a part of the Atmospheric Release Advisory Capability (ARAC) system of Lawrence Livermore National Laboratory (LLNL). The MATHEW is a code for three-dimensional wind field analysis. Using observed data, it calculates the mass-consistent wind field of grid cells by a variational method. The ADPIC is a code for three-dimensional concentration prediction of gases and particulates released to the atmosphere. It calculates concentrations in grid cells by the particle-in-cell method. They are written in LLLTRAN, i.e., LLNL Fortran language and are implemented on the CDC 7600 computers of LLNL. In this report, i) the computational methods of the MATHEW/ADPIC and their auxiliary codes, ii) comparisons of the calculated results with our JAERI particle-in-cell, and gaussian plume models, iii) translation procedures from the CDC version to FACOM M-200's, are described. Under the permission of LLNL G-Division, this report is published to keep the track of the translation procedures and to serve our JAERI researchers for comparisons and references of their works.

50315 **(RISO-M—2322) Table of exposure rate constants and dose equivalent rate constants.** Lauridsen, B. (Risoe National Lab., Roskilde (Denmark)). Dec 1982. 424p. NTIS (US Sales Only), PC A18/MF A01. Order Number DE83702415.

The exposure rate constant GAMMA is calculated and tabulated for 1084 nuclides. The exposure rate constant is defined as the ratio of the product of the exposure rate and the square of the distance from a radioactive point source to the source strength Q. The dose equivalent rate constant γ is here defined as the ratio of the

mean dose equivalent rate to a water cylinder of 30 cm diameter and 100 cm height place 100 cm from a radioactive source to the source strength Q. The source is placed at the midplant of the cylinder. The dimensions of the cylinder were chosen to approximate a human phantom of 70 kg mass. The dose equivalent rate constant is calculated and tabulated for 1084 nuclides. For both quantities, GAMMA and γ, the contributions from photon energies below 30 keV and X-rays are omitted. The data are based on the Evaluated Nuclear Structure Data File, which is compiled by the Nuclear Data Group at Oak Ridge National Laboratory.

50316 **(UCRL-Trans—11874) Neutron dosimetry.** Jozsef, P. Translated from *Fizikai Szemle ;* 32: No. 4, 142-148(1982). Contract W-7405-ENG-48. 17p. NTIS, PC A02/MF A01. Order Number DE83014105.

Portions are illegible in microfiche products.

The principles of neutron dosimetry physics are examined. Measurable physical quantities characteristic of biological damage are defined and those instruments and methods with which they can be measured outlined. (ACR)

6560 Solid State Physics

REFER ALSO TO CITATION(S) 49483, 49500

50317 **(EFI—472(15)-81) Exact solution of the problem of phase transitions in the two-level model.** Izmailyan, N.Sh.; Kocharyan, A.N. (Erevanskij Fizicheskij Inst. (USSR)). 1981. 16p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702513.

The exact solution of the problem of electron phase transitions in the simplest model of electronic structure of rare-earth compounds is obtained taking into account the interaction of s and f electrons within the strong coupling limit. Thermodynamic characteristics (energy, heat capacity, equation of state) are calculated and valency behaviour under pressure is analyzed. It is shown that in the absence of the interaction with the lattice the phase transitions turn out smooth everywhere (of the II order). The allowance for the interaction of the electrons with the lattice homogeneous deformation results in the possibility of jumplike phase transitions. The comparison with other approximate solutions of the problem is presented and it is shown that only the generalized self-consistent method gives results close to the exact ones. These results are in agreement with those obtained in the Anderson lattice model and in good qualitative agreement with the available experimental data for rare-earth compounds like SmS, SmTe etc.

50318 **(IC—81/183) Entropy of percolating and random infinite clusters.** Sadiq, A.; Ahsan Khan, M. (International Centre for Theoretical Physics, Trieste (Italy)). Sep 1981. 10p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702255.

Cluster entropy, defined in terms of site-valence distribution function, is computed for site percolation on square lattices using a Monte Carlo simulation technique. At the percolation threshold this quantity is found to be insensitive to short-range attractive interactions, where it exceeds the corresponding value given by Hankey in terms of the site occupation probability. Short-range repulsive interaction gives rise to a small enhancement in its value. All of these values are, however, smaller than the entropy of an infinite cluster in which all possible valencies are equally likely to occur.

50319 **(IC—81/188) Symmetry and phase transitions.** Przystawa, J. (International Centre for Theoretical Physics, Trieste (Italy)). Sep 1981. 17p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702234.

The problem of symmetry changes at phase transitions is discussed in view of modern developments in the theory of phase transitions, as well as in terms of the classical Landau theory. Various group-theoretical criteria, or selection rules, are formulated and discussed from the point of view of how well they comply with the basic requirements of the theory of phase transition, i.e. the existence of the absolute minimum of the Landau potential (LGW Hamiltonian) and the continuity of the transition. The physical significance of those criteria is examined.

50320 **(IC—82/167) Zero-temperature renormalization of the 2D transverse Ising model.** Kamieniarz, G. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1982. 8p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702516.

A zero-temperature real-space renormalization-group method is applied to the transverse Ising model on planar hexagonal, triangular and quadratic lattices. The critical fields and the critical exponents describing low-field large-field transition are calculated.

50321 **(IC—82/168) Spin S quantum Ising model at T=0.** Kamieniarz, G.; Kowalewski, L.; Piechocki, W. (International Centre for Theoretical Physics, Trieste (Italy)). Sep 1982. 19p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702517.

The Ising model with a transverse field for a general spin S is investigated within the framework of the Green-function method in the paramagnetic region at T=0. The analysis of selfconsistent equations gives a description of softmode phase transition as well as extrapolated values of critical fields and critical energy gap exponents.

50322 **Theoretical calculations of the electronic and vibrational structure of point defects in ionic crystals.** Wood, R.F. (Oak Ridge National Lab., TN (USA)); Wilson, T.M. (Oklahoma State Univ., Stillwater (USA)). pp 186-206 of Defects in insulating crystals. Tuchkevich, V.M.; Shvarts, K.K. (eds.). Riga; Zinatne (1981). (CONF-810573—).

From International conference on defects in insulating crystals; Riga-Salaspils, USSR (18 May 1981).

The structure of the Hartree-Fock one-electron equations for simple point defects in ionic crystals is briefly discussed. The importance of polarization effects due to the diffuse nature of the wave functions in the relaxed excited states was emphasized, and the usefulness of an effective mass approximation indicated. Several approaches to the calculation of the electronic structure were discussed and evaluated. The connection between electronic structure calculations and phonon perturbations were pointed out through a brief discussion of localized perturbation theory.

50323 **Homogenization and its application. Mathematical and computational problems.** Babuska, I. (Maryland Univ., College Park). pp 89-116 of Numerical solution of partial differential equations-III, SYNSPADE 1975. Hubbard, B. (ed.). New York, NY; Academic Press Inc. (1976). (CONF-750545—). Contract AS05-76ER03443.

From Symposium on the numerical solution of partial differential equations; College Park, MD, USA (19 May 1975).

Homogenization is an approach which studies the macro-behavior of a medium by its microproperties. Attention is focused on the homogenization approach in mathematics and numerical methods in physics, mechanics and chemistry.

6561 Superconductivity

REFER ALSO TO CITATION(S) 49482, 49498, 49628

50324 **(IC—81/168) Peierls instability and superconductivity in substitutionally disordered pseudo one-dimensional conductors.** Zhang, L. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1981. 16p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702270.

With coherent potential approximation method the effect of the substitutional disorder in the pseudo one-dimensional conductors on the Peierls transition temperature (Tsub(p)) and superconductive transition temperature (Tsub(c)) has been calculated. The favourable condition for searching for somewhat high Tsub(c) superconductors in these systems has been discussed.

6570 Theoretical Physics

REFER ALSO TO CITATION(S) 49555

50325 (IA—1375, pp 15) **Manifestations of classical stochasticity in quantum mechanical bound systems.** Weissman, Y. (Israel Atomic Energy Commission, Tel Aviv); Jortner, J. (Tel Aviv Univ. (Israel)). Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

50326 (IC—81/162) **Differentiable structure on space-time manifold corresponding to total pure radiation.** Husain, S.I.; Ahsan, Z. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1981. 13p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702231.

A differentiable structure, named as (F, g, r, S)-structure with $F^3 = 0$, is endowed to the space-time manifold which is seen to correspond to the null electromagnetic field in empty space as well as to the Lichnerowicz state of total pure radiation. It is observed that the Nijenhuis tensor of this structure plays a useful role in the study of the electromagnetic as well as the gravitational field in V_4. Finally some symmetry properties admitted by V_4 with (F, g, r, S)-structure have been studied.

50327 (IC—81/189) **"Conformal spinor geometry": an attempt to "understand" internal symmetry.** Budinich, P. (International Centre for Theoretical Physics, Trieste (Italy)). Sep 1981. 26p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702235.

The natural homomorphism of pure spinors corresponding to a given Clifford algebra Csub(2n) to polarized isotropic n-planes of complex Euclidean space Esub(2n)sup(c) is taken as a starting point for the construction of a geometry called spinor geometry where pure spinors are the only elements out of which all tensors have to be constructed (analytically as bilinear polynomia of the components of a pure spinor). C_4 and C_8 spinor geometry are analyzed but it seems that C_8 spinor geometry is necessary to construct Minkowski space Msup(3,1). C_8 spinor field equations give rise in Minkowski space to a pair of Dirac equations (for conformal semispinors) presenting an SU(2) internal symmetry algebra. Mass is generated by spontaneously breaking the original O(4,2) symmetry of the spinor equation.

50328 (IC—81/193) **Classical mechanics of a breathing top.** Berg, H.P. (International Centre for Theoretical Physics, Trieste (Italy)). Sep 1981. 18p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702236.

We develop the classical mechanics of a breathing top and consider the left- and right-invariant actions on the configurations space SL(n,R). This model is compared with the affinely-rigid body, based on GL(n,R). Applications of the breathing top can be found in the theory of elasticity and hydromechanics.

50329 (IC—81/195) **Graded de-Sitter spacetime, group and algebra.** Zhang, L. (International Centre for Theoretical Physics, Trieste (Italy)). Sep 1981. 12p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702237.

The m+n dimensional flat superspace is considered and graded linear groups with their graded algebra are calculated. The 4+4 dimensional graded de-Sitter spacetime is discussed geometrically by its embedding in 5+4 dimensional flat superspace, and its isometry subgroup OSp(114) has been calculated. We have used the isomorphism between the algebra of Sp(4,R) and SO(3,2) to express the generators Ssup(ab) of SO(3,2) in terms of the generators hsup($\alpha\beta$) of the symplectic group Sp(4,R); then it is easy to obtain the graded de-Sitter algebra from the ortho-symplectic algebra OSp(114). Finally, by contraction we obtain the graded Poincare algebra, that is, the superalgebra with which we are familiar.

50330 (IC—82/75) **Ultraviolet finiteness of N = 8 supergravity, spontaneously broken by dimensional reduction.** Sezgin, E.; van Nieuwenhuizen, P. (International Centre for Theoretical Physics, Trieste (Italy)). Jun 1982. 15p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702474.

The one-loop corrections to scalar-scalar scattering in N = 8 supergravity with 4 masses from dimensional reduction, are finite. We discuss various mechanisms that cancel the cosmological constant and infra-red divergences due to finite but non-vanishing tadpoles.

50331 (IC—82/76) **Fusion of supersymmetries with gauge theories.** Rayski, J.; Rayski, J.M. Jr. (International Centre for Theoretical Physics, Trieste (Italy)). Jun 1982. 8p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702475.

A scheme of unification is discussed where the sources of gravity form a supersymmetric multiplet, but gravity is not a member of this multiplet (with spins $<= 3/2$). Gravity is introduced later as a gauge field, the global gauge being the 4-parametric translation group.

50332 (IC—82/77) **Prescription for n-dimensional Vierbeins.** Bokhari, A.H.; Qadir, A. (International Centre for Theoretical Physics, Trieste (Italy)). Jun 1982. 10p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702476.

Recent developments in supergravity have brought the n-dimensional Vierbein formalism into prominence. Here we provide a prescription for writing down a Vierbein given an arbitrary (in general non-diagonal) metric tensor in a Riemannian or pseudo-Riemannian space.

50333 (IC—82/78) **Relativistic generalization of the Newtonian force.** Qadir, A.; Quamar, J. (International Centre for Theoretical Physics, Trieste (Italy)). Jun 1982. 38p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702477.

Whereas there is no denying the essential contribution of geometrodynamics, it must be admitted that our physical intuition is still firmly based in the Newtonian concept of force. Here we extend some earlier work re-introducing the Newtonian force concept into relativity theory. Some fundamentally new insights into the relativistic effects due to charge and rotation are presented.

50334 (IC—82/86) **Quantization in rotating co-ordinates revisited.** Hussain, F.; Qadir, A. (International Centre for Theoretical Physics, Trieste (Italy)). Jul 1982. 13p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702479.

Recent work on quantization in rotating co-ordinates showed that no radiation would be seen by an observer rotating with a constant angular speed. This work used a Galilean-type co-ordinate transformation. We show that the same result holds for a Lorentz-type co-ordinate system, in spite of the fact that the metric has a co-ordinate singularity at $r\Omega = 1$. Further, we are able to define positive and negative energy modes for a particular case of a non-static, non-stationary metric.

50335 (IC—82/88) **Generalized Mayer theorem in the approximating Hamiltonian method.** Bakulev, A.P.; Bogoliubov, N.N. Jr.; Kurbatov, A.M. (International Centre for Theoretical Physics, Trieste (Italy)). Jul 1982. 10p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702480.

With the help of the generalized Mayer theorem we obtain the improved inequality for free energies of model and approximating systems, where only "connected parts" over the approximating Hamiltonian are taken into account. For the concrete system we discuss the problem of convergency of appropriate series of "connected parts".

50336 (IC—82/94) **Maximal extended supergravity theory in seven dimensions.** Sezgin, E.; Salam, A. (International Centre for Theoretical Physics, Trieste (Italy)). Jul 1982. 13p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702481.

A maximal extended supergravity Lagrangian is constructed in seven dimensions, which exhibits USp(4) approx.= SO(5) local and SL(5,R) global invariances. We find that the antisymmetric

second rank tensor fields must possess a generalized gauge invariance in order that the theory is consistent and supersymmetric. We conjecture that the theory might admit SO(5) x SO(5) Yang-Mills symmetries in d = 7 and SO(4) x SO(5) x SO(5) in d = 4 (with the last SO(5), gauging composite fields) after suitable compactification.

50337 **(IC—82/107) One generalization of the Fokker-Planck equation.** Kurbatov, A.M.; Sankovich, D.P. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1982. 20p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702455.

A closed equation for the statistical operator of the quantum dynamical system interacting with a thermostat is obtained. Then by using the Weyl's representation of operators it is shown that this equation is the generalized Fokker-Planck one.

50338 **(IC—82/143) Stability of soliton solution in NLS-type general field model.** Chakrabarti, S.; Nayyar, A.H. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1982. 12p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702461.

A model incorporating the nonlinear Schroedinger equation and its generalizations is considered and the stability of its periodic-in-time solutions under the restriction of a fixed charge Q is analysed. It is shown that the necessary condition for the stability is given by the inequality deltaQ/deltaω<0, where ω is the parameter of periodicity of the solution in time. In particular, one specific class of Lagrangians is considered and, in addition, the sufficient conditions for the stability of the soliton solutions are also determined. This study thus examines both the necessary and the sufficient conditions for the stability of the solutions of nonlinear Schroedinger equation and some of its generalizations.

50339 **(IC—82/160) Instability in a hard-disc system in a narrow box.** Wojciechowski, K.W.; Pieranski, P.; Malecki, J. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1982. 14p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702464.

It is shown that a system of N (N→infinity) hard discs (of diameter σ) in a narrow box of width D (D<sqrt 3 σ) and length L=Nl is unstable for a certain range of D and l when D is variable.

50340 **(IC—82/162) Strong gravity: an approach to its source.** Chela-Flores, J.; Varela, V. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1982. 17p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702465.

We study the source of strong gravity. In the first part we find analytic expressions for a hadron source, in which an electric charge and a scalar field are assigned to it, thus obtaining an extended Reissner-Nordstrom scalar field solution to strong gravity. We then show correspondence of a massive charged scalar field wave equation with a generalized Gross-Pitaevskii equation for superfluidity. This allows us to relate the parton-parton average (gluon-like) potential strength U with the overall (confining) strong interaction strength kappa. Hadron structure arises, in our model, unlike QCD, from the interplay of two different strong coupling constants.

50341 **(IC—82/184) Composite gravity and composite supergravity.** Lukierski, J. (International Centre for Theoretical Physics, Trieste (Italy)). Sep 1982. 8p. (CONF-820871—4). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702466.

From 11. international colloquium on group theoretical methods in physics; Istanbul, Turkey (23 Aug 1982).

It is known that the composite YM H-gauge theory can be constructed from σ-fields taking values in a symmetric Riemannian space G/H. We extend such a framework to graded σ-fields taking values in supercosets. We show that from supercoset σ-fields one can construct composite gravity, and from supercoset σ-superfields the composite supergravity models.

50342 **(IC—82/195) Interaction of electric and magnetic charges II.** Adawi, I. (International Centre for Theoretical Physics, Trieste (Italy)). Sep 1982. 10p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702468.

The problem of a head-on collision between a spherically symmetric electric and magnetic charge is reconsidered. It is shown that the rotational angular momentum a charge acquires is determined by the amount of the angular momentum which the charge removes from the field by virtue of its extension. The interaction energy of each charge with the dipole it induces in the other charge is equal to the rotational energy of the charge itself. This results in simple expressions for the effective potential, and the distance of closest approach as given by classical electrodynamics and nonrelativistic mechanics.

50343 **(IC—82/204) Extension of the principle of minimal coupling to particles with magnetic moments.** Carmeli, M. (International Centre for Theoretical Physics, Trieste (Italy)). Oct 1982. 9p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702470.

The principle of minimal coupling is extended to (charged or uncharged) particles with magnetic moments. The extension is made by means of angular momentum methods.

50344 **(IC—82/208) Spontaneous compactification in six-dimensional Einstein-Maxwell theory.** Randjbar-Daemi, S.; Salam, A.; Strathdee, J. (International Centre for Theoretical Physics, Trieste (Italy)). Oct 1982. 31p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702471.

A discrete set of solutions to the classical Einstein-Maxwell equations in six-dimensional spacetime is considered. These solutions have the form of a product of four-dimensional constant curvature spacetime with a 2-sphere. The Maxwell field has support on the 2-sphere where it represents a monopole of magnetic charge, n = +-1, +-2,... The spectrum of massless and massive states is obtained for the special case of the flat 4-space, and the solution is shown to be classically stable. The limiting case where the radius of the 2-sphere becomes small is considered and a dimensionally reduced effective Lagrangian for the long range modes is derived. This turns out to be an SU(2) x U(1) gauge theory with chiral couplings.

50345 **(IC—82/212) Merons in a generally covariant model with Gursey term.** Akdeniz, K.G.; Smailagic, A. (International Centre for Theoretical Physics, Trieste (Italy)). Oct 1982. 11p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702472.

We study meron solutions of the generally covariant and Weyl invariant fermionic model with Gursey term. We find that, due to the presence of this term, merons can exist even without the cosmological constant. This is a new feature compared to previously studied models.

50346 **(IFVE-OTF—82-36) Covariant canonical quantization and operator analogs of Dirac constraints.** Sveshnikov, K.A. (Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Serpukhov. Inst. Fiziki Vysokikh Ehnergij). 1982. 17p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702487.

Principle of operation of a covariant canonical quantization scheme considered earlier has been demonstrated using a simple example. It is obvious that couplings and commutation relations in new variables realizing explicitly the Poincare group representation may be deciphered in these variables, at least, in loop expansion terms and lead in the first approximation to reasonable results. One has nothing to say yet for higher orders as the algebraic structure of these relations is not clear unlike the replacement of variables in integrals. As to more complicate models, the similar procedure is applied to them only with purely algebraic complications.

50347 **(IFVE-OTF—82-79) Covariant perturbation theory near the classical solution.** Sveshnikov, K.A. (Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Serpukhov. Inst. Fiziki Vysokikh Ehnergij). 1982. 23p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702489.

The covariant formulation of the Bogolyubov collective coordinates method is considered on the basis of one-soliton sector quantization of self-acting scalar field in the two-dimensional space-time. In contrast to the Dirac approach the separation of the space-time symmetry group is realized directly at quantized variables while to additional conditions required for conservation of the number of degrees of freedom of the system one can attach a sufficiently clear meaning. In fact they are equivalent to the Dirac relations, however they do not require appealing to Hamiitonian formatism and are obtained directly in the Lagrange formulation and do not contain problems related to operator ordering. Covariant in each order perturbation theory near one-soliton solution suggests to consider directly the Heisenberg field in the proper approximation. This gives a possibility to correctly introduce asymptotic model states on the basis of the LSZ procedure and give physical interpretation of quantized field excitation spectrum in perturbation theory orders considered.

50348 **(ITEF—24(1982)) Quantum mechanics. A fresh look on old perturbation theory.** Turbiner, A.V. (Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Moscow. Inst. Teoreticheskoj i Ehksperimental'noj Fiziki). 1982. 72p. (In Russian). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702490.

From School of ITEP physics; Moscow (USSR) (Feb 1981).

A certain nonstandard approach to the problem of calculation of the spectrum in the nonrelativistic quantum mechanics is outlined. Along with simplicity and economy it is characterized by many advantages as compared with traditional methods: in the cases when the traditional Rayleigh-Schroedinger perturbation theory (PT) can be realized, the suggested approach is algebraic and permits to analyse the properties of any correction, it provides the possibility to evaluate the accuracy of variational calculations and besides there naturally arises from it the criterion of "advisability" of probe functions selection and as for the procedure elaboration no knowledge of the whole spectrum of the unperturbed problem is required, there appears arbitrariness in the unperturbed problem selection which permits to construct the converging PT, the process of transition matrix elements calculation becomes algebraic. Numerous examples demonstrate approach possibilities which permit to easily calculate various PT corrections, confirm old calculations and obtain new results.

50349 **(ITEP—101(1982)) Higher orders of the perturbation theory and summation of perturbational series in quantum mechanics.** Popov, V.S.; Weinberg, V.M. (Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Moscow. Inst. Teoreticheskoj i Ehksperimental'noj Fiziki). 1982. 52p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702491.

Calculation of higher orders of the perturbation theory is considered for screened Coulomb potentials. Particular cases of such potentials are the Yukawa potential, a familiar object of nuclear physics, and the funnel-shaped potential, applied to analysis of heavy quark-antiquark systems. The calculation of higher perturbational orders is reduced to recursive relations, quite appropriate for computer. The Pade approximants and a modified Pade-Borel summation method are applied for calculation of sums of diverging PT series. It is shown that in the considered problems higher orders of the PT determine the behaviour of E(g) in the region of strong coupling (Esub(g)-the energy of eigen-value).

50350 **(ITP—82-94-E) Relativistic statistical physics and thermodynamics of ideal gases.** Sinyukov, Yu.M. (AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki). 1982. 33p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702494.

The paper studies the relativistic transformational properties of statistical and thermodynamical quantities for Boltzmann, Bose and Fermi gases. It is shown that when statistical systems are described relativistically it is very important to take account the boundary conditions, the reason being that an equilibrium system is not closed. The quantum field theory methods are used to obtain a description of gases in canonical, grand canonical and pressure ensembles in an arbitrary inertial system. The covariant partition function method is developed. The results may find application in hadron physics.

50351 **(JINR—E-2-82-451) Summation of asymptotic expansions in certain problems of quantum mechanics and quantum field theory.** Ilchev, A.S.; Mitrjushkin, V.K. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics). 1982. 10p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702498.

A method for summation of alternating asymptotic series which is based on a modified Borel transformation with a Borel transform B(z) which is an entire function of z is proposed. The method is designed to produce results when B(z) exhibits a power-law asymptotic for Z large and positive. The method is illustrated on the examples of the groundstate energy level of the quantum-mechanical anharmonic oscillator gx^4, the critical exponents and the Gell-Mann-Low function in g(PHI vector^3)^2-field theory.

50352 **(JINR—R-2-82-118) Multidimensional isotropic oscillator: transitions between the cartesian and hyperspherical bases.** Pogosyan, G.S.; Smorodinskij, Ya.A.; Ter-Antonyan, V.M. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics). 1982. 11p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702245.

By a diagrammatic method of construction of spherical hrmonics, the transition matrices between the Cartesian and hyperspherical bases of a multidimensional isotropic oscillator are calculated. The transition matrices are shown to be expressed in terms of the Klebsch-Gordan coefficients for SU(2) group, continued onto moments multiple to 1/4. A diagrammatic method is proposed for construction of these matrices for an arbitrary hyperspherical tree.

50353 **(JINR—R-2-82-528) Approximation of the phase paths in the Feynman path integral.** Fiziev, P.P. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics). 1982. 10p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702501.

The finite dimensional approximation of Feynman integrals for finite dimensional systems has been analyzed. The admissible finite dimensional approximations for the paths in the phase-space has been found in a general form. It is shown that the widespread concept of the summation over all paths is wrong and should be replaced by the summation over a certain class of paths on a family of Mayer surfaces.

50354 **(JINR—R-4-82-603) Concepts of dynamics and convention of simultaneity.** Nikolenko, V.G. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Neutron Physics). 1982. 10p. (In Russian). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702502.

The results of the refusal from the convention of simultaneity of remoted events in relativistic dynamics are considered. The operational difinitions of dynamical quantities are given (without using the remoted simultaneity). This leads to the refusal from the concept about increasing of mass with increasing the velocity, based on this convection. For formulating the integral law conservation the concept of a set of unbound events is introduced. This set includes as particular cases sets of simultaneous events corresponding to different conventions of simultaneity.

50355 (JINR-D—17-81-758, pp 94-103) **Application of the functional integration method to the Dicke-type models.** Popov, V.N.; Fedotov, S.A. (AN SSSR, Leningrad. Matematicheskij Inst.). 1981. (In Russian). NTIS (US Sales Only), PC A25/MF A01. (CONF-8108151—).

From 2. international symposium on selected topics in statistical mechanics; Dubna, USSR (25 Aug 1981).

The asymptotics of the statistical model sum of the Dicke-type (Z/Z_6) is obtained and strictly proved at large N (N is an

atomic number; Z is a statistical model sum; Z_0 is a statistical free system sum) using the functional integration method. The model with one bose-field mode is considered. A detailed proof is carried out at T > Tsub(c). An idea of the proof is planned and asymptotic formulae are presented for T < Tsub(c) and in the vicinity of Tsub(c).

50356 **(NBI-HE—82-42) Lorentz invariance as a low energy phenomenon.** Chadha, S.; Nielsen, H.B. (Niels Bohr Inst., Copenhagen (Denmark)). Sep 1982. 19p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702247.

It is propsed that the various symmetries observed in nature be regarded as infrared attractive fixed points of a large class of theories which are not endowed with these symmetries a priori. That this hypothesis is feasible is explicitly demonstrated for the case of Lorentz invariance. The strategy is to consider a suitable noncovariant model of electrodynamics, and to show by calculating the relevant β-functions that this model simulates Lorentz invariance better and better as the energy scale is progressively lowered.

50357 **(UWThPh—82-2) Adiabatic theorem in quantum statistical mechanics.** Narnhofer, H.; Thirring, W. (Vienna Univ. (Austria)). 1982. 11p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702250.

We show that with suitable assumptions the equilibrium states are exactly the states invariant under adiabatic local perturbations. The relevance of this fact to the problem of ergodicity is discussed.

50358 **(UWThPh—82-16) Equivalence of adiabatic invariance and the KMS-condition.** Thirring, W. (Vienna Univ. (Austria)). 1982. 8p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702503.

The paper outlines the reasons why for infinite quantum systems the KMS-states are exactly the ones which are invariant under local adiabatic perturbations.

50359 **(UWThPh—82-18) Spectral concentration in the nonrelativistic limit.** Gesztesy, F.; Grosse, H.; Thaller, B. (Vienna Univ. (Austria)). 1982. 5p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702504.

First order relativistic corrections to the Schroedinger operator according to Foldy and Wouthuysen are rigorously discussed in the framework of singular perturbation theory. For Coulomb plus short-range interactions we investigate the corresponding spectral properties and prove spectral concentration and existence of first order pseudoeigenvalues in the nonrelativistic limit.

50360 **(UWThPh—82-21) Multiparticle coulomb system with bound state a threshold.** Hoffmann-Ostenhof, M.; Hoffmann-Ostenhof, T.; Simon, B. (Vienna Univ. (Austria)). 1982. 9p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702251.

We consider the two electron Hamiltonian $H = -\Delta_1 - \Delta_2 - r_1^{-1} - r_2 sub\text{-}^{1} + A r_{12}^{-1}$ at precisely that critical value of A where the ground state energy has just hit the continuum. For that A, it is proven that H has a square integrable eigenfunction at the bottom of the continuum.

50361 **(UWThPh—82-23) Remarks of the linearized superhair.** Aichelburg, P.C.; Gueven, R. (Vienna Univ. (Austria)). 1982. 10p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702279.

The l = 1/2 multipole solution of the Rarita-Schwinger equation of 0(2) supergravity is studied on the maximally extended extreme Reissner-Nordstroem geometry. The role of the supersymmetry transformations in maintaining the regularity at the future and past horizons is exhibited. A supergauge independent discussion of the supercharge as a (linearized) new black hole parameter is given.

6580 Mathematical Physics

REFER ALSO TO CITATION(S) 48941, 48942, 50323

50362 **(IA—1375, pp 13) New method for equation of state calculations. Linear combinations of basis potentials.** Rosenfeld, Y. Jul 1982. NTIS (US Sales Only), PC A13/MF A01.

In Research Laboratories annual report 1981.

50363 **(IC—81/199) Representation of generalized Dirac (Clifford) algebras.** Srivastava, T. (International Centre for Theoretical Physics, Trieste (Italy)). Oct 1981. 11p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702238.

Some results of Brauer and Weyl and of Jordan and Wigner on irreducible representations of generalized Dirac (Clifford) algebras have been proved, adopting a new and simple approach which (i) makes the whole subject straightforward for physicists and (ii) simplifies the demonstration of the fundamental theorem of Pauli.

50364 **(IC—81/228) Existence of bounded solutions of integral equations with infinite delay.** Deeba, E. (International Centre for Theoretical Physics, Trieste (Italy)). Dec 1981. 8p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702242.

We prove the existence of bound solutions for an integral equation with infinite delay.

50365 **(IC—82/96) Global solvability in the whole space for a class of first order quasilinear hyperbolic systems.** Tatsien, L.; Jia-hong, S. (International Centre for Theoretical Physics, Trieste (Italy)). Jul 1982. 13p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702482.

The global solvability in the whole (t,x) space is considered for first-order quasilinear hyperbolic systems; the conditions satisfied by the system itself in order that the system admit global smooth solutions in the whole (t,x) space (GSSWS) are determined. In order to get the existence of a nontrivial (unknown functions not equal to constants) GSSWS, the system of equations involved does not have to be linearly degenerate. This is proved for general quasilinear systems of diagonal form with n equations. Finally, the case of non-strictly hyperbolic systems is considered briefly.

50366 **(IC—82/109) Algebra of pseudo-differential operators over C*-algebra.** Mohammad, N. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1982. 19p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702456.

Algebras of pseudo-differential operators over C*-algebras are studied for the special case when in Hormander class Ssub(rho,delta)sup(m)(Ω) Ω = Rsup(n); rho = 1, delta = 0, m any real number, and the C*-algebra is infinite dimensional non-commutative. The space B, i.e. the set of A-valued C*-functions in Rsup(n) (or Rsup(n) x Rsup(n)) whose derivatives are all bounded, plays an important role. A denotes C*-algebra. First the operator class Ssub(phi,0)sup(m) is defined, and through it, the class Lsub(1,0)sup(m) of pseudo-differential operators. Then the basic asymptotic expansion theorems concerning adjoint and product of operators of class Ssub(1,0)sup(m) are stated. Finally, proofs are given of L_2-continuity theorem and the main theorem, which states that algebra of all pseudo-differential operators over C*-algebras is itself C*-algebra.

50367 **(IC—82/148) Pade approximant for Chandrasekhar H function.** Saad, E.A.; El Wakil, S.A.; Haggag, M.H.; Machali, H.M. (International Centre for Theoretical Physics, Trieste (Italy)). Aug 1982. 14p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702463.

The Chandrasekhar H function and its moment are calculated by Pade approximant. Numerical results are given and compared with the exact values.

50368 **(IC—82/203) Join decomposition of certain spaces.** Bhattarai, H.N. (International Centre for Theoretical Physics, Trieste (Italy)). Oct 1982. 10p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702469.

The notion of a join of double coset and orbit spaces (studied as Pasch geometries) is given in Pacific J. Math., 98, No. 2 (1982). A space which is a join of projective spaces is naturally the generalized projective space of Frink (Trans. Amer. Math. Soc., 60 (1946)) and the join decomposition is equivalent to the concept of direct union decomposition into irreducible spaces. In this paper geometries the decomposition of which give either projective spaces, groups or orbit spaces isomorphic to Q/Q^+ are characterized. The direct union decomposition of Frink (op. cit.) is obtained as a corollary.

50369 **(JINR—E-5-82-54) Typical representations of the Lie superalgebra sl(1, n).** Palev, T.D.; Stojchev, O.Ts. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics). 1982. 6p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702244.

Explicit formulae for the class of finite-dimensional irreducible representations, called typical representations, of the special linear Lie superalgebra sl(1, n) are written down.

50370 **(JINR—E-17-82-585) Intrinsic symmetry of the scaling laws and generalized relations for critical indices.** Plechko, V.N. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics). 1982. 6p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702496.

It is shown that the scaling laws for critical indices can be expressed as a consequence of a simple symmetry principle. Heuristic relations for critical indices of generalizing scaling laws for the case of arbitrary order parameters are presented, which manifestly have a symmetric form and include the standard scaling laws as a particular case.

50371 **(SAND—83-0936) New algorithm for constrained nonlinear least-squares problems. Part I.** Hanson, R.J.; Krogh, F.T. (Sandia National Labs., Albuquerque, NM (USA); Jet Propulsion Lab., Pasadena, CA (USA)). Jul 1983. Contract AC04-76DP00789. 26p. NTIS, PC A03/MF A01. Order Number DE83016773.

A new Gauss-Newton algorithm is presented for solving nonlinear least squares problems. The problem statement may include simple bounds or more general constraints on the unknowns. The algorithm uses a trust region that allows the objective function to increase with logic for retreating to best values. The computations for the linear problem are done using a least squares system solver that allows for simple bounds and linear constraints. The trust region limits are defined by a box around the current point. In its current form the algorithm is effective only for problems with small residuals, linear constraints and dense Jacobian matrices. Results on a set of test problems are encouraging.

6590 Communication, Education, History, And Philosophy

REFER ALSO TO CITATION(S) 50447

70 FUSION ENERGY

7001 Plasma Research

REFER ALSO TO CITATION(S) 48961, 50445

50372 **(DOE/ET/51013—84) Coil and shell characteristics for passive stabilization.** Thome, R.J.; Pillsbury, R.D. Jr.; Langton, W.G.; Mann, W.R. (Massachusetts Inst. of Tech., Cambridge (USA). Plasma Fusion Center). [nd]. Contract AC02-78ET51013. 67p. (PFC/RR—83-14). NTIS, PC A04/MF A01. Order Number DE83016533.

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This report presents results of an investigation into the means for estimating the level of the induced fields and their associated time constants. In all cases, the plasma was represented by a single, circular current filament which could be displaced instantaneously either verticaly or radially. The latter was considered for the sake of completeness even though the need for radial stabilizing elements is not anticipated at this time.

50373 **(DOE/ET/52040—T14) Gyroscopic stabilization of a spheromak plasma configuration.** Saoutic, B. (Illinois Univ., Urbana (USA). Fusion Studies Lab.). 1983. Contract AC02-76ET52040. 57p. (COO—2218-273). NTIS, PC A04/MF A01. Order Number DE83016554.

Thesis.

Simple analytical model based on energy principle has been developed for and utilized in a study of the gyroscopic stabilization of spheromak tilting. It proposed that the stability to shifting in a gyroscopically tilt stabilized spheromak can be achieved via proper field shaping without resorting to cumbersome devices such as close fitting conducting shells, coils or beam particles. First, the credibility of the gyroscopic stabilization for the tilting is established by treating a spheromak plasma in a straight uniform external magnetic field. Secondly, the stabilization of the shifting by using a curved external field is investigated and it is demonstrated that the concept of a moving plasmoid reactor is compatible with a positive field decay index. Finally, the gyroscopic stabilization in an external equilibrium field with a positive field decay index has been studied with the conclusion that it provides the necessary stability against the tilt/shift instabilities.

50374 **(DOE/ET/53051—56) High-power ion-cyclotron-resonance heating in the Wisconsin Levitated Octupole.** Fortgang, C.M. (Wisconsin Univ., Madison (USA). Dept. of Physics). May 1983. Contract AC02-76ET53051. 187p. NTIS, PC A09/MF A01. Order Number DE83016154.

Thesis.

Ion cyclotron resonance heating has been investigated, both experimentally and theoretically, on the Wisconsin Levitated Octupole. Heating of both ions and electrons has been observed. Typically, a two component ion energy distribution is produced (300 eV and 50 eV) with the application of 500 kW of rf power into a 5 x 10^{13} cm^{-3} density plasma. Power is coupled to the plasma with an antenna that also serves as the inductor of an oscillator tank circuit. The oscillator is tunable from 1 to 3 MHz and can be applied for periods up to 10 msec. The experiments were performed with hydrogen, gun injected plasmas.

50375 **(GTFR—42) Neutral-beam-driven impurity flow reversal in tokamaks.** Stacey, W.M. Jr.; Bennett, R.B.; Sigmar, D.J. (Georgia Inst. of Tech., Atlanta (USA). School of Nuclear Engineering and Health Physics). Jul 1983. Contract AS05-78ET52025. 25p. NTIS, PC A02/MF A01. Order Number DE83016153.

A theory is outlined which is capable of explaining the observed effects of neutral-beam injection on impurities in tokamak plasmas. In the collisional regime, it is shown for a representative model problem that for sufficiently strong co-injection the outward impurity flux component produced by the radial electric field becomes larger than the inward flux components due to the density gradient, rotation and direct beam-impurity momentum exchange, thereby producing an outward impurity flux. In the mixed regime, a preliminary version of the theory provides a reasonable interpretation of the PLT impurity flow reversal experiments. This preliminary theory, when adjusted to match the PLT results, predicts significant impurity flow reversal in TFTR and in a plasma of the size of FED and INTOR.

50376 **(LBL—10070) 2-D skin-current toroidal-MHD-equilibrium code.** Feinberg, B.; Niland, R.A.; Coonrod, J.; Levine, M.A. (Lawrence Berkeley Lab., CA (USA)). Sep 1982. Contract AC03-76SF00098. 54p. NTIS MF A01. Order Number DE83016916.

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A two-dimensional, toroidal, ideal MHD skin-current equilibrium computer code is described. The code is suitable for inter-

active implementation on a minicomptuer. Some examples of the use of the code for design and interpretation of toroidal cusp experiments are presented.

50377 **(N—8317313) Determination of the temperature of a dense plasma from a spectral line shift.** Sultanov, A.M.; Ageyev, V.A. (National Aeronautics and Space Administration, Washington, DC (USA)). Nov 1982. 9p. (NASA-TM—77000). NTIS, PC A02/MF A01.

Transl. from Dokl. Akad. Nauk Tadzh. SSR (USSR), Vol. 16, No. 7, 1973 p 26-29.

The method of maximum spectral line shift proposed by Bardocz, et al, (1966) was successfully applied in the diagnostics of dense plasmas produced by high power pulse discharges. It is pointed out that the effect of the shock wave pressure on the spectral line shift has to be taken into account in order to obtain accurate results with this method for high power discharges. A pressure dependent function was introduced in the expression given by those authors to provide the necessary correction.

50378 **(ORNL/TM—8671) Investigation of edge neutral flux on the ISX-B tokamak using a low-energy charge-exchange analyzer.** Thomas, D.M. (Oak Ridge National Lab., TN (USA)). Aug 1983. Contract W-7405-ENG-26. 86p. NTIS, PC A05/MF A01. Order Number DE83016959.

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To study the emission of D^0 from the periphery of a tokamak plasma, a low-energy neutral particle spectrometer optimized for ($16 < E < 500$ eV) has been built and employed on the Impurity Study Experiment (ISX-B) tokamak. The diagnostic utilizes a cesium vapor cell to form negative ions from the incident D^0 neutrals and a four-channel electrostatic analyzer to energy analyze the negative ions. The spectrometer was absolutely calibrated using D^0 beams formed by electron capture by positive ions in a gas cell and by photo-detachment of negative ions by a yttrium-aluminum-garnet laser. For the observation region chosen on ISX-B (120° toroidally away from the limiter, near the gas puff), the neutral particle flux has a two-component nature. These data are well fit by two separate exponential distributions of equivalent temperatures 6 to 8 eV for particle energies below about 80 eV and 70 to 80 eV for particle energies above 80 eV. For ohmically heated discharges, the measured particle flux in the energy range 25 to 700 eV is $\sim 2.5 \times 10^{18}$ $cm^{-2}s^{-1}$; the mean particle energy is $\sim$ 70 eV, and the calculated flux at the wall is $\sim$ 30 mW/cm^2. The major effect of neutral beam heating is to increase the particle flux in the 25- to 700-eV range by a factor of 3.

50379 **(ORNL/TM—8752) Equilibrium and stability properties of high-beta torsatrons.** Carreras, B.A.; Hicks, H.R.; Holmes, J.A.; Lynch, V.E.; Garcia, L.; Harris, J.H.; Hender, T.C.; Masden, B.F. (Oak Ridge National Lab., TN (USA)). Aug 1983. Contract W-7405-ENG-26. 48p. NTIS, PC A03/MF A01. Order Number DE83016346.

Equilibrium and stability properties of high-beta torsatrons have been investigated using numerical and semianalytical techniques based on the method of toroidal averaging. The averaged equilibria have been compared with those obtained using full three-dimensional codes. Good agreement is obtained, thus validating the averaged method approach. We have studied the stability of plamsas for configurations with different aspect ratios and numbers of field periods. The role of the vertical field has also been studied in detail. The main conclusion is that for moderate aspect ratio torsatrons (A/sub p/ $\leqq$ 8), the self-stabilizing effect of the magnetic axis shift is large enough to open a direct path to the second stability region.

50380 **(ORNL/TM—8758) Parametric study of lower-hybrid current drive in the FED-A design.** Iida, H.; Ehst, D.A.; Peng, Y.K.M. (Oak Ridge National Lab., TN (USA)). Aug 1983. Contract W-7405-ENG-26. 32p. NTIS, PC A03/MF A01. Order Number DE83016458.

In the FED-A concept, a quasi-steady-state operating scenario is conceived in which the plasma current is maintained by the transformer coil during burn at high density and by the lower hybrid wave during transformer recharge at low density. A parametric study is carried out to obtain optimum plasma and wave parameters in the recharging phase.

50381 **(ORNL/TM—8773) Neoclassical transport in a multiple-helicity torsatron in the low-collisionality regime - strong radial electric-field limit.** Shaing, K.C. (Oak Ridge National Lab., TN (USA)). Aug 1983. Contract W-7405-ENG-26. 38p. NTIS, PC A03/MF A01. Order Number DE83016463.

Analytic expressions for the neoclassical fluxes in a multiple-helicity torsatron are calculated in the strong radial electric-field limit, where the poloidal E vector x B vector drift frequency omega/sub E/ is much larger than the poloidal del B drift frequency omega/sub del B/. The expressions are valid in the collisional-frequency regime characterized by omega/sub E/ > nu/sub eff/, the effective collisional frequency for helically trapped particles. Besides the usual collisionless detrapping and boundary-layer processes, a new effect arises due to the strong pitch-angle dependence of the radial drift induced by $\partial \epsilon$/sub H//$\partial \theta$ not equal to 0, where ϵ/sub H/ is the effective helical modulation.

50382 **(PPPL—2019) Experimental control of the spheromak tilting instability.** Munson, C.; Janos, A.; Wysocki, F.; Yamada, M. (Princeton Univ., NJ (USA). Plasma Physics Lab.). Jul 1983. Contract AC02-76CH03073. 17p. NTIS, PC A02/MF A01. Order Number DE83016333.

The magnetohydrodynamic (MHD) tilting instability of the spheromak configuration has been experimentally investigated by recording the time evolution of the magnetic field configuration with small magnetic probes. Passive coil systems such as the figure eight and saddle coils have been proven experimentally to be effective against this instability.

50383 **(PPPL—2023) Fishbone and internal kinks.** Strauss, H.; Park, W.; Monticello, D.; Izzo, R.; White, R.; McGuire, K.; Manickam, J.; Goldston, R. (Princeton Univ., NJ (USA). Plasma Physics Lab.). Jul 1983. Contract AC02-76CH03073. 16p. NTIS, PC A02/MF A01. Order Number DE83016331.

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The internal-kink mode, combined with neutral-beam heating and beam losses, appears to be responsible for the fishbone soft x-ray oscillations in PDX. Nonlinear simulations of both ideal and resistive kinks are presented and shown to be consistent with experimental observations. The internal kink may also be important in low-beta internal disruptions.

50384 **(UCID—19832) Initial assessment of the MHD stability of TMX-U.** Nexsen, W.E. (Lawrence Livermore National Lab., CA (USA)). 4 Aug 1983. Contract W-7405-ENG-48. 10p. NTIS, PC A02/MF A01. Order Number DE83016521.

In its operation to date TMX-U has reached values of beta which, for all except the hot electron beta, are close to the proposal values and has not encountered MHD stability problems. The hot electron beta values are presently limited by gyrotron output power and pulse length as well as ion confinement time. Further exploration of stability awaits full thermal barrier operation.

50385 **(UCID—19852) Multidipole magnetic fields for plasma confinement.** Fang, T.M. (Lawrence Livermore National Lab., CA (USA)). Jul 1983. Contract W-7405-ENG-48. 22p. NTIS, PC A02/MF A01. Order Number DE83016014.

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Plasma confinement by permanent magnets has been studied. An analytic formula for the field of a single bar magnet has been obtained. Generalization to various configurations of multidipole fields has also been found. Any two-dimensional field may now be completely described by a simple function of complex variables in closed form. Vector potential has also been obtained by integrating over a prescribed Riemann surface. The confinement of plasma by

multidipole fields then becomes obvious through conservation principles.

50386 **(UCRL—89200) Fokker-Planck equation in mirror research.** Post, R.F. (Lawrence Livermore National Lab., CA (USA)). 11 Aug 1983. Contract W-7405-ENG-48. 37p. (CONF-830909—2). NTIS, PC A03/MF A01. Order Number DE83016568.

From Course and workshop on mirror-based and field-reversed approaches to magnetic fusion; Varenna, Italy (7 Sep 1983).

Open confinement systems based on the magnetic mirror principle depend on the maintenance of particle distributions that may deviate substantially from Maxwellian distributions. Mirror research has therefore from the beginning relied on theoretical predictions of non-equilibrium rate processes obtained from solutions to the Fokker-Planck equation. The F-P equation plays three roles: Design of experiments, creation of classical standards against which to compare experiment, and predictions concerning mirror based fusion power systems. Analytical and computational approaches to solving the F-P equation for mirror systems will be reviewed, together with results and examples that apply to specific mirror systems, such as the tandem mirror.

50387 **(UCRL—89537) X-ray streak crystal spectography.** Kauffman, R.L.; Brown, T.; Medecki, H. (Lawrence Livermore National Lab., CA (USA)). 1 Jul 1983. Contract W-7405-ENG-48. 5p. (CONF-830874—12). NTIS, PC A02/MF A01. Order Number DE83015618.

From 27. annual international technical symposium on high speed photography, videography and photonics; San Diego, CA, USA (21 Aug 1983).

We have built an x-ray streaked crystal spectrograph for making time-resolved x-ray spectral measurements. This instrument can access Bragg angles from 11° to 38° and x-ray spectra from 200 eV to greater than 10 keV. We have demonstrated resolving powers, $E/\Delta E > 200$ at 1 keV and time resolution less than 20 psec. A description of the instrument and an example of the data is given.

50389 **Engineering models for alpha-particle-driven anomalous heating and spatial transport in toroidal devices.** Sutton, W.R.; Choi, C.K.; Miley, G.H. (University of Illinois, Urbana, IL 61801). *Transactions of the American Nuclear Society;* **43**: 170-171(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

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REFER ALSO TO CITATION(S) 49471, 49481, 49507, 49507, 49815, 50379

50388 **(AD-A—127612/0) Use of induced spatial incoherence for uniform illumination on laser fusion targets. Memorandum report.** Lehmberg, R.H.; Obenschain, S.P. (Naval Research Lab., Washington, DC (USA)). 11 Apr 1983. 13p. (NRL-MR—5029). NTIS, PC A02/MF A01.

We report a technique to achieve very uniform illumination of laser irradiated targets by inducing a controlled amount of transverse spatial incoherence in the output beam of a broadband laser. The spatial incoherence is created by imposing different optical delays upon different transverse sections of the beam, and choosing the delay increments to be larger than the laser coherence time tc = 1 delta. This technique may allow easy attainment of the pellet illumination uniformity required for laser fusion.

50390 **(CONF-830404—75) Design of a high-temperature first wall/blanket for a d-d compact Reversed-Field-Pinch reactor (CRFPR).** Dabiri, A.E.; Glancy, J.E. (Science Applications, Inc., La Jolla, CA (USA). Applied Plasma Physics and Technology Div.). May 1983. Contract AC03-81ER53113. 7p. NTIS, PC A02/MF A01. Order Number DE83016128.

From 5. symposium on the training of nuclear facility personnel; Gatlinburg, TN, USA (25 Apr 1983).

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A high-temperature first wall/blanket which would take full advantage of the absence of tritium breeding in a d-d reactor was designed. This design which produces steam at p = 7 MPa and T = 538°C at the blanket exit eliminates the requirement for a separate steam generator. A steam cycle with steam-to-steam reheat yielding about 37.5 percent efficiency is compatible with this design.

50391 **(CONF-830776—2) Superconductor stability, 1983: a review.** Dresner, L. (Oak Ridge National Lab., TN (USA)). 1983. Contract W-7405-ENG-26. 30p. NTIS, PC A03/MF A01. Order Number DE83015506.

From MIT short course on large-scale applications of superconductivity; Cambridge, MA, USA (19 Jul 1983).

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Three main topics have been discussed in this paper, namely, internally cooled superconductors, cooling by superfluid helium, and metastable magnets. The discussion of each has centered around a dominant idea, and it is fitting to highlight these ideas by way of conclusion. With regard to internally cooled superconductors, most of what we have learned in the last few years centers on the strong motion caused by the thermal expansion of helium. How naive were our early calculations that treated the helium as though it were incompressible. Our discussion of He-II was organized around the Gorter-Mellink relation and the solutions of the nonlinear diffusion equation it gives rise to. And our discussion of metastable magnets revolved around the fruitful concept of the MPZ. These three ideas are sturdy trunks that support much of the thought about superconductor stability that has flowered in the past several years.

50392 **(DOE/ET/51013—70) Model for stresses in circular magnets for toroidal fusion devices.** Noterdaeme, J.M. (Massachusetts Inst. of Tech., Cambridge (USA). Plasma Fusion Center). Jun 1983. Contract AC02-78ET51013. 26p. (PFC/RR—83-7). NTIS, PC A03/MF A01. Order Number DE83016535.

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Circular coils in toroidal fusion devices can be subjected to in plane bending moments resulting from the interaction of the current with the inhomogeneous magnetic field. To take into account the support of the coils both externally through the in plane structure (a central cylinder), and internally through the out of plane structure (the coil forms a toroidal assembly which can take up the net inward force by a reaction in the toroidal direction) the coil is modelled as a circular beam on the elastic foundation. From the solutions for a single force acting on such a beam, we derive the formulas for an arbitrary cos n θ variation of a distributed force. The general system is solved by Fourier expansion of the in plane loads and external reaction forces. The fraction of the net inward force reacted by the central cylinder and by the intercoil structure can be varied continously, and a minimum for the bending moments is found for a particular value of this fraction (depending on the aspect ratio, the stiffness of the coil, and the intercoil structure). It is suggested that the best way to optimize the design of the toroidal coils is to choose the coil shape such that within constraints the circumferential length is minimal. To minimize the moments one should optimize the design of the center support cylinder, the design of the out of plane structure and especially the distribution of the reaction force between both. Only a small fraction (≃ 20%) of the net inward force should be taken up by a central cylinder.

50393 **(DOE/ET/51013—85) Active stabilization and start-up coil characteristics.** Thome, R.J.; Pillsbury, R.D. Jr.; Mann, W.R. (Massachusetts Inst. of Tech., Cambridge (USA). Plasma Fusion Center). [nd]. Contract AC02-78ET51013. 55p. (PFC/RR—83-15). NTIS, PC A04/MF A01. Order Number DE83016534.

Recent operating scenarios for tokamaks have considered the use of separate control coils to provide active vertical stabilization of the plasma. An initial rapid vertical plasma displacement would be stabilized by eddy currents induced in passive elements, then, as the induced field decays, a set of active coils would be excited to provide the required field. The placement of coils to serve these functions is dependent on spatial demands imposed by other subsys-

tems. The power and energy required by the coils to perform these tasks is critically dependent on their location and eddy current effects induced by their rapidly changing fields. The purpose of this study was to provide the means to estimate the power and energy requirements and to present the results of a preliminary investigation of the eddy current effects. A simplified criterion was developed for relating the characteristic decay time of the passive system to the charge time for the active system.

50394 **(DOE/ET/51013—91) 12-T solenoid-design options for the MFTF-B Upgrade.** Schultz, J.H.; Diatchenko, N. (Massachusetts Inst. of Tech., Cambridge (USA). Plasma Fusion Center). 29 Jul 1983. Contract AC02-78ET51013. 62p. (PFC/RR—83-20). NTIS, PC A04/MF A01. Order Number DE83016646.

The major options for the 12 T magnets examined here are the selection of normal, superconducting or hybrid normal/superconducting magnet systems. The tradeoffs are those between the higher initial cost of superconducting magnet system, the need for thick shielding of superconducting magnets, higher recirculating power in the normal magnets and poorly characterized reliability of lightly shielded normal magnets. The size and shielding tradeoffs among these options are illustrated. The design concepts presented here are evaluated only for the first design iteration of MFTF-B + T, mentioned above. In particular, all concepts now being considered have made topological improvements in the center cell, so that neutral beam power is no longer a strong function of choke coil size. This function was strongly favorable to the use of normal magnets over superconducting magnets and its absence will be discussed qualitatively in the cost comparisons.

50395 **(DOE/ET/53016—83) High-beta tokamak research. Annual progress report, 1 August 1982-1 August 1983.** Navratil, G.A. (Columbia Univ., New York (USA)). Aug 1983. Contract AC02-76ET53016. 42p. NTIS, PC A03/MF A01. Order Number DE83016362.

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The main research objectives during the past year fell into four areas: (1) detailed observations over a range of high-beta tokamak equilibria; (2) fabrication of an improved and more flexible high-beta tokamak based on our understanding of the present Torus II; (3) extension of the pulse length to 100 usec with power crowbar operation of the equilibrium field coil sets; and (4) comparison of our equilibrium and stability observations with computational models of MHD equilibrium and stability.

50396 **(DOE/ET/53088—95) Construction of three-dimensional vacuum magnetic fields with dense nested flux surfaces.** Cary, J.R. (Texas Univ., Austin (USA). Inst. for Fusion Studies). May 1983. Contract FG05-80ET53088. 47p. NTIS, PC A03/MF A01. Order Number DE83012600.

Toroidal vacuum magnetic fields are analyzed by the surface of section technique and noncanonical perturbation theory. The surface of section analysis shows that it is easy to find magnetic fields with an outermost flux surface of relatively small aspect ratio. However, as the aspect ratio is decreased, so is the rotational transform of the outermost flux surface. A new method of averaging combined with noncanonical perturbation theory shows that island overlap can account roughly for this loss of rotational transform. Finally, it is shown that one can significantly decrease the stochasticity and island structure by making small modifications to the magnetic field.

50397 **(EGG—2261) Fusion Safety Program. Annual report, FY 1982.** Crocker, J.G.; Cohen, S. (EG and G Idaho, Inc., Idaho Falls (USA)). Jul 1983. Contract AC07-76ID01570. 74p. NTIS, PC A04/MF A01. Order Number DE83016350.

The Fusion Safety Program major activities for Fiscal Year 1982 are summarized in this report. The program was started in FY-79, with the Idaho National Engineering Laboratory (INEL) designated as lead laboratory and EG and G Idaho, Inc., named as prime contractor to implement this role. The report contains four sections: EG and G Idaho, Inc., Activities at INEL includes major portions of papers dealing with ongoing work in tritium implantation experiments, tritium risk assessment, transient code development, heat transfer and fluid flow analysis, and high temperature oxidation and mobilization of structural material experiments. The section Outside Contracts includes studies of superconducting magnet safety conducted by Argonne National Laboratory, experiments concerning superconductor safety issues performed by the Francis Bitter Magnet Laboratory of the Massachusetts Institute of Technology (MIT) to verify analytical work, a continuation of safety and environmental studies by MIT, a summary of lithium safety experiments at Hanford Engineering Development Laboratory, and the results of tritium gas conversion to oxide experiments at Oak Ridge National Laboratory. A List of Publications and Proposed FY-83 Activities are also presented.

50398 **(EGG—2266) Risk assessment of a fusion-reactor fuel-processing system.** Bruske, S.Z.; Holland, D.F. (EG and G Idaho, Inc., Idaho Falls (USA)). Jul 1983. Contract AC07-76ID01570. 58p. NTIS, PC A04/MF A01. Order Number DE83016889.

The probabilistic risk assessment (PRA) methodology provides a means to systematically examine the potential for accidents that may result in a release of hazardous materials. This report presents the PRA for a typical fusion reactor fuel processing system. The system used in the analysis is based on the Tritium Systems Test Assembly, which is being operated at the Los Alamos National Laboratory. The results of the evaluation are presented in a probability-consequence plot that describes the probability of various accidental tritium release magnitudes.

50399 **(GA-A—17142) Magnetic fluctuations in high-β/sub p/ tokamak plasmas.** Lee, J.K.; Chu, M.S.; Helton, F.J.; Park, W. (GA Technologies, Inc., San Diego, CA (USA)). Jun 1983. Contract AT03-76ET51011. 8p. (CONF-830908—3). NTIS, PC A02/MF A01. Order Number DE83015872.

From 11. European conference on controlled fusion and plasma physics; Aachen, F.R. Germany (5 Sep 1983).

The magnetic fluctuations resulting from the nonlinear evolutions of high-β/sub p/ long parallel wavelength resistive MHD modes are studied for tokamak plasmas with a free boundary. Large amplitude fluctuations cause increased magnetic field stochasticity with increasing $\epsilon\beta$/sub p/. These fluctuations, when coupled to an anomalous energy loss mechanism, may lead to β/sub p/-saturation in total input power. Modeling of the H-mode with a line tied plasma to the divertor plate shows substantial stabilization of edge instabilities. Calculations for recent high β noncircular discharges in DIII compare well with experimental observations.

50400 **(GA-A—17144) Ideal-MHD beta limits: scaling laws and comparison with Doublet III high-beta plasmas.** Bernard, L.C.; Bhadra, D.K.; Helton, F.J.; Lao, L.L.; Todd, T.N. (GA Technologies, Inc., San Diego, CA (USA)). Jun 1983. Contract AT03-76ET51011. 7p. (CONF-830908—4). NTIS, PC A02/MF A01. Order Number DE83015873.

From 11. European conference on controlled fusion and plasma physics; Aachen, F.R. Germany (5 Sep 1983).

Doublet III (DIII) recently has achieved a value for β, the ratio of volume averaged plasma to magnetic pressure, of 4.5%. This β value is in the range required for an economically attractive tokamak reactor, and also close to the relevant limit predicted by ideal-MHD theory. It is therefore of great interest to assess the validity of the theory by comparison with experiment and thus to have a basis for the prediction of future reactor performance. A large variety of plasma shapes have been obtained in DIII. These shapes can be divided into two classes: (1) limiter discharges, and (2) diverted discharges, which are of great interest because of their good confinement in the H-mode operation. We derive simple scaling laws from the variation of optimized ideal-MHD beta limits (β/sub c/) with plasma shape parameters. The current profile is optimized for fixed plasma shapes, separately for the high-n (ballooning) and the low-n (kink) modes. Results are presented in the form of suitability normalized curves of β versus poloidal beta, β/sub p/, for both ballooning and kink modes in order to simultaneously compare all the DIII experimental data.

50401 **(LA—9788-MS) Study on diffusion of the vertical magnetic field in the toroidal stabilizing shell of the ZT-40M reversed-field-pinch device.** Vogel, H.F.; Preis, H. (Los Alamos National Lab., NM (USA)). Jul 1983. Contract W-7405-ENG-36. 31p. NTIS, PC A03/MF A01. Order Number DE83016353.

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FEDIFF is a finite-element circuit-network code in which conductors are modeled in a three-dimensional (3-D) lattice of metal plates, each plate possessing finite thickness. The plates are properly interconnected and magnetically coupled to all external and internal circuit elements. The lattice is transformed to become a circuit network and to be integrated. The result of computations is discussed, in which FEDIFF has been adapted to solve 3-D vertical field diffusion problems in the toroidal stabilizing shell of the ZT-40M device at Los Alamos, when a vertical magnetic field is applied as a pulse. The stabilizing shell is made of aluminum, 2.2 cm thick, that is one skin depth at 110 Hz. Because the shell is constructed with a poloidal insulated gap, the vertical magnetic field diffuses into the shell, differently in the gap region than elsewhere. With the existing aspect ratio of major to minor radius being six, we show tht field diffusion in a straight cylinder exhibits virtually the same characteristics as the toroidal configuration does, away from the gap, provided the cylinder possesses the same wall thickness and material makeup as the toroidal shell. The accuracy of the present eddy current field calculations is 2.8%.

50402 **(LA—9809-MS) Preliminary results from ZT-40M using active feedback for equilibrium control.** Massey, R.S.; Buchenauer, C.J.; Miller, G.; Barnes, G. (Los Alamos National Lab., NM (USA)). Jul 1983. Contract W-7405-ENG-36. 15p. NTIS, PC A02/MF A01. Order Number DE83016356.

Active feedback control of the major radial equilibrium position has been applied to the ZT-40M reversed-field pinch. Well-controlled discharges exhibit less wall interaction in the region of the poloidal field gap as well as better sustainment of the electron density.

50403 **(LBL—15066) Efficient, radiation-hardened, 400- and 800-keV neutral-beam injection systems.** Anderson, O.A.; Cooper, W.S.; Fink, J.A.; Goldberg, D.A.; Ruby, L.; Soroka, L.; Tanabe, J. (Lawrence Berkeley Lab., CA (USA)). Apr 1983. Contract AC03-76SF00098. 9p. (CONF-830406—94). NTIS, PC A02/MF A01. Order Number DE83015691.

From 5. topical meeting on technology of fusion energy; Knoxville, TN, USA (26 Apr 1983).

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We present designs for two negative-ion based neutral beam lines with reactor-level power output. Both beam lines make use of such technologically advanced features as high-current-density surface-conversion ion sources, transverse-field-focussing (TFF) acceleration and transport, and laser photodetachment. For the second of these designs, we also presented detailed beam and vacuum calculations, as well as a brief description of a proof-of-principle test system currently under development.

50404 **(LBL—16153) Heavy-ion fusion with rf linac and cyclotron technology.** Grunder, H.; Leemann, B.; Selph, F. (Lawrence Berkeley Lab., CA (USA)). May 1983. Contract AC03-76SF00098. 31p. NTIS, PC A03/MF A01. Order Number DE83016656.

This paper examines the performance of another possibility for accumulating beam - an isochronous ring - because it can also be used to accumulate a large current, but with this type of ring stacking and extraction occur before instabilities have time to build up. Another feature is that bunch structure is preserved during stacking, and thus rebunching can be avoided. We will look at the use of an isochronous ring for a demonstration high temperature experiment which has been proposed as a means for developing and proving the accelerator technology, but with a more modest investment than required for the fusion driver, then examine the possible extrapolation of this concept to a demonstration driver.

50405 **(LBL—16222) Negative-ion sources for neutral-beam systems.** Ehlers, K.W. (Lawrence Berkeley Lab., CA (USA)). Jun 1983. Contract AC03-76SF00098. 14p. (CONF-830920—5). NTIS, PC A02/MF A01. Order Number DE83016001.

From 7. symposium on sources and ion assisted technology and 4. international conference on ion and plasma assisted techniques; Kyoto, Japan (12 Sep 1983).

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There are three main methods now used to produce negative hydrogen ions: charge exchange, volume production, and surface production, and this paper briefly describes these three systems.

50406 **(ORNL/TM—8791) Novel method of aligning ATF-1 coils.** Rome, J.A.; Harris, J.H.; Neilson, G.H.; Jernigan, T.C. (Oak Ridge National Lab., TN (USA)). Aug 1983. Contract W-7405-ENG-26. 12p. NTIS, PC A02/MF A01. Order Number DE83016399.

The coils for the Advanced Toroidal Facility (ATF-1) torsatron may be easily aligned before the machine is placed under vacuum. This is done by creating nulls in the magnetic field by energizing the coils in various configurations. All of the nulls in vertical bar B vector vertical bar occur on the z-axis. When the nulls coincide, the coils are properly aligned.

50407 **(PB—83-203117) Controlled nuclear fusion: current research and potential progress. Supporting paper no. 3.** (National Academy of Sciences - National Research Council, Washington, DC (USA)). 1978. 67p. NTIS, PC A04/MF A01.

This study is part of a larger, comprehensive study of the nation's prospective energy economy during the period 1985-2010, with special attention to the role of nuclear power among the alternative energy systems. This report discusses the current state of fusion technology and provides an estimate of its future progress.

50408 **(PPPL—2011) FED-R: a fusion engineering device utilizing resistive magnets.** Jassby, D.L.; Kalsi, S.S. (Princeton Univ., NJ (USA). Plasma Physics Lab.). Jun 1983. Contract AC02-76CH03073. 20p. (CONF-830406—97). NTIS, PC A02/MF A01. Order Number DE83016332.

From 5. topical meeting on technology of fusion energy; Knoxville, TN, USA (26 Apr 1983).

The principal purpose of the FED-R tokamak facility is to provide a substantial quasisteady flux of fusion neutrons irradiating a large test area in order to carry out thermal, neutronic, and radiation effects testing of experimental blanket assemblies. The emphasis on reliable nuclear testing capability demands that the plasma physics characteristics and technological features of the fusion machine be chosen as close to mid-1980s state of the art as possible, with the important exception that FED-R requires high-duty-factor operation. The outboard nuclear test region is at least 80-cm deep with approximately 60 m^2 of exposure area. The neutron wall loading is 0.4 MW/m^2 in Stage I operation (Q/sub p/ = 1.5) and 1.3 MW/m^2 in Stage II (Q/sub p/ = 2.5). The toroidal field coils are fabricated of water-cooled copper plates with demountable joints and operate steady state with a power dissipation of 180 MW in Stage I and 280 MW in Stage II.

50409 **(SAI—02383-453LJ/APPAT-3) Preliminary analysis of a carbon/carbon-fiber-composite plasma direct converter.** Gurol, H.; Shuy, G.W.; Dabiri, A.E.; Dirling, R.B. Jr.; Eitman, D. (Science Applications, Inc., La Jolla, CA (USA). Applied Plasma Physics and Technology Div.; Science Applications, Inc., Irvine, CA (USA)). May 1983. Contract AC03-81ER53113. 7p. (CONF-830406—93). NTIS, PC A02/MF A01. Order Number DE83016124.

From 5. topical meeting on technology of fusion energy; Knoxville, TN, USA (26 Apr 1983).

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The feasibility of a PDC that uses radiatively cooled grids and collector plate made of carbon/carbon fiber composite is presented. Elimination of the coolant makes a thin grid design possible. The advantages are increased direct conversion efficiency, no tritium permeation into grid tube coolant, and compact design.

50410 **(SAI—02383-455LJ/APPAT-5) Design of superheated-steam-producing blanket for a d-d tokamak.** Dabiri, A.E.; Glancy, J.E.; Gurol, H.; Cherdack, R.N. (Science Applications, Inc., La Jolla, CA (USA); Burns and Roe, Inc., Oradell, NJ (USA)). May 1983. Contract AC03-81ER53113. 6p. (CONF-830406—96). NTIS, PC A02/MF A01. Order Number DE83016126.

From 5. topical meeting on technology of fusion energy; Knoxville, TN, USA (26 Apr 1983).

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A high-temperature first wall/limiter/blanket which would take full advantage of the absence of tritium breeding in a d-d reactor was designed. This design, which produces steam at P = 12.4 MPa and T = 538°C at the blanket exit, eliminates the requirement for a separate steam generator. A steam cycle with steam-to-steam reheat yielding about 40.5 percent efficiency is compatible with this design.

50411 **(SAI—02383-457LJ/APPAT-7) d-d tandem-mirror reactor with central-cell potential modification.** Shuy, G.W.; Dobrott, D. (Science Applications, Inc., La Jolla, CA (USA). Applied Plasma Physics and Technology Div.). May 1983. Contract AC03-81ER53113. 7p. (CONF-830406—91). NTIS, PC A02/MF A01. Order Number DE83016016.

From 5. topical meeting on technology of fusion energy; Knoxville, TN, USA (26 Apr 1983).

A zero-dimensional plasma physics model for the density and power balance of a Cat-d TMR has been developed from an existing code that models a d-t TMR operating with a positive central cell potential. The new Cat-d code models all potential operating modes and has been benchmarked.

50412 **(SAI—02383-458LJ/APPAT-8) Alternate fuels in fusion reactors.** Dobrott, D. (Science Applications, Inc., La Jolla, CA (USA). Applied Plasma Physics and Technology Div.). May 1983. Contract AC03-81ER53113. 10p. (CONF-830406—92). NTIS, PC A02/MF A01. Order Number DE83016125.

From 5. topical meeting on technology of fusion energy; Knoxville, TN, USA (26 Apr 1983).

The question of reactor performance relative to fuel cycle is examined here in the restricted context d-t versus d-d (with variations) in tokamaks, reversed-field pinches and tandem mirrors, although results relative to other concepts and cycles are reviewed. Each reactor concept is assessed relative to the relevant physics, engineering, cost and safety issues. There are distinct physics and technical leverages for each of the concepts, but many common features as well. For example, all three concepts require no blanket tritium breeding and have a much lower tritium inventory than their d-t counterparts, as well as, longer blanket lifetime, greater blanket efficiency, higher neutron energy multiplication and less activation. The physics constraints are not necessarily greater and cost per net power output between d-t and d-d reactors can be comparable.

50413 **(SAND—83-0385C) Status of PBFA II engineering.** Cook, D.L. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 5p. (CONF-830621—40). NTIS MF A01. Order Number DE83015343.

From IEEE power electronics specialists conference; Albuquerque, NM, USA (6 Jun 1983).

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PBFA II is a 36-module accelerator of roughly 3 1/2 times the power and energy of PBFA I. It is presently in the final design stage and is expected to become operational in early 1986. In the two years since the PBFA II project was initiated, rapid progress has been made in many areas. Design limitations in each of the major accelerator sections have been identified. A baseline configuration was developed and has been updated twice. A demonstration experiment (DEMON) was designed and constructed to serve as a prototype module. Results from this experiment are now enabling us to quantify the design limitations and are helping us move toward completion of the accelerator design.

50414 **(UCID—19856) Electromagnetic forces related to flashlamp failures in the Nova/Novette amplifiers.** Grant, B. (Lawrence Livermore National Lab., CA (USA)). Jul 1983. Contract W-7405-ENG-48. 39p. NTIS, PC A03/MF A01. Order Number DE83016524.

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A high rate of breakage in flashlamps destined for the Nova and Novette laser system amplifiers has prompted an investigation into the cause. Discussed herein is the possibility that electromagnetic forces (resulting from large currents in these lamps) are bending the anodes and cathodes and, thus, cracking the glass seals. Specifically, the forces resulting from these currents are approximated without indicating whether or not these forces are sufficient to break the seals. The results demonstrate that forces up to .9 N/cm (.514 lbs/in.) directed away from the reflector panel can be distributed along the anodes and cathodes. Also, the scalloped nature of the panel provides good isolation between lamps; the lamp-to-lamp forces are negligible. Time domain plots of the forces are included as well as the computer program which was developed for this investigation.

50415 **(UCRL—53434) Feasibility of a laser or charged-particle-beam fusion-reactor concept with direct electric generation by magnetic-flux compression.** Lasche, G.P. (Lawrence Livermore National Lab., CA (USA)). Jun 1983. Contract W-7405-ENG-48. 210p. NTIS PC A10/MF A01. Order Number DE83015735.

A new concept for an inertial-confinement fusion reactor is described which, because of its fundamentally different approach to blanket geometry and energy conversion, makes possible a unique combination of high efficiency, high power density, and low radioactivity. The conventional blanket is replaced with a liquid-density mass of lithium contiguously surrounding the fusion yield. This compact blanket configuration produces the maximum shock-induced kinetic energy in liquid metal and the maximum neutron absorption per unit mass. The shock-induced kinetic energy of the liquid lithium is converted directly to electricity with high efficiency by work done against a pulsed normal-conducting magnetic field applied to the exterior of the lithium.

50416 **(UCRL—88696) Thermal performance of the MFTF magnets.** VanSant, J.H. (Lawrence Livermore National Lab., CA (USA)). 3 Aug 1983. Contract W-7405-ENG-48. 11p. (CONF-830841—3). NTIS, PC A02/MF A01. Order Number DE83016275.

From Cryogenic engineering conference and international cryogenic materials conference; Colorado Springs, CO, USA (15 Aug 1983).

A yin-yang pair of liquid-helium (LHe) cooled, superconducting magnets were tested last year at the Lawrence Livermore National Laboratory (LLNL) as part of a series of tests with the Mirror Fusion Test Facility (MFTF). These tests were performed to determine the success of engineering design used in major systems of the MFTF and to provide a technical base for reacoping from a single-mirror facility to the large tandem-mirror configuration (MFTF-B) now under construction. The magnets were cooled, operated at their design current and magnetic field, and warmed to atmospheric temperature. In this report, we describe their thermal behavior during these tests.

50417 **(UCRL—89199) Magnetic-mirror principle as applied to fusion research.** Post, R.F. (Lawrence Livermore National Lab., CA (USA)). 11 Aug 1983. Contract W-7405-ENG-48. 41p. (CONF-830909—1). NTIS, PC A03/MF A01. Order Number DE83016368.

From Course and workshop on mirror-based and field-reversed approaches to magnetic fusion; Varenna, Italy (7 Sep 1983).

A tutorial account is given of the key physics issues in the confinement of high temperature plasma in magnetic mirror systems. The role of adiabatic invariants and particle drifts and their relationship to equilibrium and stability are discussed, in the context of the various forms of mirror field geometry. Collisional effects and the development and the control of ambipolar potentials are reviewed. The topic of microinstabilities is discussed together with the means for their control. The properties and advantages for

fusion power purposes of various special embodiments of the mirror idea, including tandem mirrors, are discussed.

50418 **(UCRL—89603) Microwave kinoform for magnetic fusion.** Gallagher, N.C. Jr.; Sweeney, D.W. (Lawrence Livermore National Lab., CA (USA)). 19 Jul 1983. Contract W-7405-ENG-48. 9p. (CONF-830874—13). NTIS, PC A02/MF A01. Order Number DE83015844.

From 27. annual international technical symposium on high speed photography, videography and photonics; San Diego, CA, USA (21 Aug 1983).

A microwave kinoform that modifies both the phase and polarization of an incident wavefront has been designed. This kinoform for the TMX-U magnetic fusion experiment has been fabricated and tested. The design procedure, method of fabrication, and experimental test results are discussed.

50419 **(KFK-tr—686) Honeycomb surface plasma source for anions.** Bel'chenko, Yu.I. (AN SSSR, Novosibirsk. Inst. Yadernoj Fiziki). Sep 1982. Translation of IYaF—82-54. 14p. (In German). NTIS (US Sales Only), PC A02/MF A01. Order Number DE83781078.

A honey-comb surface plasma source is described, to be used for application in injectors. In this source a two-dimensional geometric focussing is realized in which the negative ions from the extended emitting surface of the cathode are focussed towards the holes of the multiple-aperture extraction system.

50420 **Utility of a low gain ICF facility.** Bohachevsky, I.O.; Booth, L.A.; Frank, T.G. (Los Alamos National Laboratory, P.O. Box 1663, Los Alamos, NM 87545). *Transactions of the American Nuclear Society;* **43**: 183-185(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

50421 **Current status of tritium safety research for fusion reactors.** Crocker, J.G.; Holland, D.F. (EG & G Idaho Inc., P.O. Box 1625, Idaho Falls, ID 83415). *Transactions of the American Nuclear Society;* **43**: 176-177(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

50422 **A review of FED-INTOR tritium issues.** Finn, P.A.; Abdou, M.A.; Anderson, J.; Baskes, M.I.; Holland, D.; Rogers, M.; Wilson, K.L. (Argonne National Laboratory, 9700 S. Cass Avenue, Argonne, IL 60439). *Transactions of the American Nuclear Society;* **43**: 177-178(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

50423 **Tritium permeation through stainless steel first walls.** Baskes, M.I.; Bauer, W.; Wilson, K.L. (Sandia National Laboratories, P.O. Box 969, Livermore, CA 94550). *Transactions of the American Nuclear Society;* **43**: 178(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

50424 **Simulation studies of anomalous slowing down of fusion products.** Sutton, W.R.; Choi, C.K.; Miley, G.H. (University of Illinois, Urbana, IL 61801). *Transactions of the American Nuclear Society;* **43**: 171-172(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

50425 **Discrete nuclear elastic scattering effects in Cat-D and D^{3}He fusion plasmas.** Galambos, J. (University of Illinois, Urbana, IL 61801). *Transactions of the American Nuclear Society;* **43**: 172-173(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

50426 **Fusion reaction cross section in high-temperature muon-catalyzed fusion.** Takahashi, H.; Moats, A. (Brookhaven National Laboratory, Upton, NY 11973). *Transactions of the American Nuclear Society;* **43**: 174-175(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

50427 **Impurity radiation constraints for ^{3}He production from deuterium-based plasmas.** Gring, J.; Maceda, E. (Lynchburg College, Lynchburg, VA 24501). *Transactions of the American Nuclear Society;* **43**: 169-170(1982). (CONF-821103—).

From American Nuclear Society winter meeting; Washington, DC, USA (14 Nov 1982).

99 GENERAL AND MISCELLANEOUS

9901 Management

50428 **(SAND—83-1648C) Toward telegraphy in recruiting brochures.** Garner, W.L. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 9p. (CONF-8309125—1). NTIS, PC A02/MF A01. Order Number DE83015624.

From Annual practical conference on communication; Knoxville, TN, USA (29 Sep 1983).

Use of a telegraphic style in writing Sandia's recruiting brochure is described.

9902 Mathematics And Computers

REFER ALSO TO CITATION(S) 49838, 49876, 50159, 50257, 50314

50429 **(AEEW-R—1573) CADS: a FORTRAN subroutine package to aid symbolic dataflow in FORTRAN programs.** Richards, L.R.P.; Butland, A.T.D.; Symonds, A.G. (UKAEA Atomic Energy Establishment, Winfrith). Jul 1982. 36p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702441.

The Core Allocation and Dataflow System, CADS, consists of two parts, VARY and VARYIO. VARY provides a means of organising the use of data store in a program by allowing the programmer to reference and manipulate areas of data store by names of the programmer's subprogram, and therefore the complete program, to be independent of its data sources or the destination of its results. CADS therefore provides a system of symbolic dataflow.

50430 **(IC—82/44) Distortions in power spectra of digitized signals - I: General formulations.** Njau, E.C. (International Centre for Theoretical Physics, Trieste (Italy)). Apr 1982. 19p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702442.

When a continuous signal f(t) is digitized and then spectrally analysed, the resultant energy spectral density $R(\omega)$ is given as $R(\omega) = 'F(\omega) * D(\omega)'^2$, where $F(\omega)$ is the exact Fourier transform of f(t), $D(\omega)$ is the exact Fourier transform of the digitization process and * denotes convolution operation. A notable practical problem in spectral analysis is how to adequately decouple $D(\omega)$ from $R(\omega)$ and hence obtain the exact energy spectral density of f(t), i.e. $'F(\omega)'^2$, since $R(\omega) \rightarrow 'F(\omega)'^2$ only if $D(\omega) \rightarrow$ delta(ω) or (under certain conditions) when $D(\omega) \rightarrow$ delta(ω-ω_0) or if $D(\omega) \rightarrow \Sigma$sub(n) delta($\omega$-$\omega$sub(n)), where the latter is a sufficiently spaced series of delta functions and ωsub(j) is constant for a given j. A solution to this problem requires, among others, thorough understanding of $D(\omega)$, how it relates to $F(\omega)$ and hence the manner or degree to which $D(\omega)$ distorts or contaminates $F(\omega)$ to form $R(\omega)$. In this paper, we have developed exact analytical expressions of $D(\omega)$ that are well related to the corresponding $F(\omega)$ in the cases when f(t) is a simple sinusoid as well as when it is in the form of a more complex function. It is established that in either of these cases, $D(\omega)$ is a clear function of the salient parameters of both f(t) and $F(\omega)$. The contents of this paper are used in Part II to examine the manner

and extent to which D(ω) causes distortions in R(ω) under given conditions, and also to establish a procedure by which such distortions may be decoupled from a practically computed R(ω). Other related issues such as frequency shifts in computed power spectra are also discussed therein.

50431 **(IC—82/45) Distortions in power spectra of digitized signals - II: Suggested solution.** Njau, E.C. (International Centre for Theoretical Physics, Trieste (Italy)). Apr 1982. 18p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702443.

In Part I of this report we developed analytical expressions which represent exactly the energy density spectra of "digitization processes" that are essentially involved in spectral analysis of continuous signals. Besides, we related the spectral energy density of each digitization process to the parameters of the exact spectral energy density of the corresponding signal. On this basis, we briefly discussed the forms of distortions (or false structures) which are present in normally computed power spectra when the corresponding spectra of the digitization processes are not sufficiently decoupled from or nullified in the computed spectra. The biggest worry with regard to these distortions is not only that they may mask the actual information contained in the original signal, but also they may tempt the researcher to establish false characteristics about the signal involved. It is in this context that any reasonable method that could be used (even conditionally) to pinpoint false structures in computed power spectra would be both timely and useful. A simple, handy guidance through which some portions of computed energy density spectra which are dominated by the false structures mentioned above, can be located is presented herein. Equations are presented which give the various frequencies at which false peaks may be located in such "contaminated" portions of computed energy density spectra. The occurrence of frequency shifts in computed power spectra is also briefly discussed.

50432 **(IC—82/69) Distortions in two- and three-dimensional power spectra.** Njau, E.C. (International Centre for Theoretical Physics, Trieste (Italy)). Jun 1982. 8p. NTIS (US Sales Only), PC A02/MF A01. Order Number DE83702444.

We show that some formulations developed earlier by the author may easily be extended to apply to two- and three-dimensional cases. Brief formulations to that effect are presented and these are supplemented by a two-dimensional illustrative example.

50433 **(JAERI—1274) Modular programming method at JAERI.** Asai, Kiyoshi; Katsuragi, Satoru (eds.). (Japan Atomic Energy Research Inst., Tokyo). Feb 1982. 60p. NTIS (US Sales Only), PC A04/MF A01. Order Number DE83701475.

In this report the histories, concepts and a method for the construction and maintenance of nuclear code systems of Japan Atomic Energy Research Institute (JAERI) are presented. The method is mainly consisted of novel computer features. The development process of the features and experiences with them which required many man-months and efforts of scientists and engineers of JAERI and a computer manufacturer are also described. One of the features is a file handling program named datapool. The program is being used in code systems which are under development at JAERI. The others are computer features such as dynamic linking, reentrant coding of Fortran programs, interactive programming facility, document editor, quick system output viewer and editor, flexible man-machine interactive Fortran executor, and selective use of time-sharing or batch oriented computer in an interactive porgramming environment. In 1980 JAERI has replaced its two old computer systems by three FACOM M-200 computer systems and they have such features as mentioned above. Since 1981 most code systems, or even big single codes can be changed to modular code systems even if the developers or users of the systems will not recognize the fact that they are using modular code systems. The purpose of this report is to describe our methodology of modular programming from aspects of computer features and some of their applications to nuclear codes to get sympathetic understanding of it from persons of organizations who are concerned with the effective use of computers, especially, in nuclear research fields.

50434 **(JAERI-M—82-018) Applicability of vector processing to large-scale nuclear codes.** Ishiguro, M.; Harada, H.; Matsuura, T.; Okuda, M.; Ohta, F.; Umeya, M. (Japan Atomic Energy Research Inst., Tokyo). Mar 1982. 119p. (In Japanese). NTIS (US Sales Only), PC A06/MF A01. Order Number DE83702439.

To meet the growing trend of computational requirements in JAERI, introduction of a high-speed computer with vector processing faculty (a vector processor) is desirable in the near future. To make effective use of a vector processor, appropriate optimization of nuclear codes to pipelined-vector architecture is vital, which will pose new problems concerning code development and maintenance. In this report, vector processing efficiency is assessed with respect to large-scale nuclear codes by examining the following items: 1) The present feature of computational load in JAERI is analyzed by compiling the computer utilization statistics. 2) Vector processing efficiency is estimated for the ten heavily-used nuclear codes by analyzing their dynamic behaviors run on a scalar machine. 3) Vector processing efficiency is measured for the other five nuclear codes by using the current vector processors, FACOM 230-75 APU and CRAY-1. 4) Effectiveness of applying a high-speed vector processor to nuclear codes is evaluated by taking account of the characteristics in JAERI jobs. Problems of vector processors are also discussed from the view points of code performance and ease of use.

50435 **(JAERI-M—82-019) Vectorization of diffusion code VENTURE using CRAY-1 and FACOM 230-75 APU.** Kamada, M.; Kadotani, H.; Harada, H. (Japan Atomic Energy Research Inst., Tokyo). Mar 1982. 66p. (In Japanese). NTIS (US Sales Only), PC A04/MF A01. Order Number DE83702445.

Three-dimensional neutron-diffusion code VENTURE has been vectorized to run on the vector processors, CRAY-1 and FACOM 230-75 APU (Array Processor Unit). Vector processing effect is observed as the CPU time reduction of about 50% to the scalar processing case for CRAY-1, and about 70% for FACOM 230-75 APU. The whole process of converting the code from scalar-oriented programming to vector-oriented one is described in some detail with emphasizing the importance of changing the code structure.

50436 **(JAERI-M—82-029) Development of data acquisition system for large amount data with the mass storage system.** Akimoto, H. (Japan Atomic Energy Research Inst., Tokyo). Apr 1982. 79p. (In Japanese). NTIS (US Sales Only), PC A05/MF A01. Order Number DE83702440.

The data acquisition system for large amounts of data have been developed with the mass storage system of JAERI to reduce loads for the data processing, especially for the management of magnetic tapes, and to simplify procedures of the data processing. Data of the Cylindrical Core Test Facility (CCTF) test were used as a sample. All data of the CCTF test was stored in the mass storage system of JAERI to minimize the load for the managements of magnetic tapes. Program for data dump, plot and analysis of the CCTF test, AREAD1, has been developed to simplify procedure of the data processing. TSS comand procedure, PLOT, has been also developed to reduce the turnaround time for data plot. In the new data acquisition system, magnetic tapes were used only once as inputs to store data in the mass storage system and the load for managements of magnetic tapes was reduced extremely. The turnaround time of the data processing was also reduced by the development of the new data acquisition system. It took only a few minutes to get a plot of data by the new data acquisition system, while it took a few hours by the old data acquisition system with magnetic tapes.

50437 **(JAERI-M—82-041) Software for transformation and map drawing of numerical informations for land.** Tabei, M.; Nakamura, Y. (Japan Atomic Energy Research Inst., Tokyo). May 1982. 38p. (In Japanese). NTIS (US Sales Only), PC A03/MF A01. Order Number DE83702449.

A software for transformation and map drawing of numerical Informations for land has been developed. The software can be easily used to make topographical data and draw maps in large

computing codes such as computing system for predicting environmental radioactivity in case of emergency. In this report, theory of transformation of numerical Informations for land by map projection, structure of the software, and a few examples to which the software is applicable, are described in detail.

50438 **(NP—3770327) Boundary element program for the solution of two- and three-dimensional problems in the field of thermoelasticity with volume forces.** Neureiter, W. (Technische Univ. Muenchen (Germany, F.R.). Fakultaet fuer Maschinenwesen). 9 Mar 1982. 164p. (In German). NTIS (US Sales Only), PC A08/MF A01. Order Number DE83770327.

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A system of programs is presented for the solution of two- and three-dimensional thermoelastic problems with volume forces. These programs are based on potential theory. The Betti-equation can be considered as the starting equation of the numerical method which, in the literature, is termed boundary element method. This equation is then transformed to a singular integral equation: The Kelvin-solution can be taken as a reference solution for the Betti-equation. In contrast to other numerical methods, the essential advantage of the boundary element method is, that in the case of thermoelastic problems, with volume forces the mathematical description of the problem is taken along the boundary of the device, thus reducing the number of dimensions by one. Only the boundary has to be split up in elements to describe the geometry and the boundary values by form functions and discrete lattice points. Linear and quadratic form functions are used for approximation in the general three-dimensional version of the code. The levels of approximation for the geometry and the boundary values can be combined in an arbitrary way. In the two-dimensional version the boundary values and the geometry can be described by cubic form functions and spherical arcs respectively.

50439 **(ORNL/CSD—118) Mathematics and statistics research progress report, period ending June 30, 1983 .** Beauchamp, J.J.; Denson, M.V.; Heath, M.T.; Lever, W.E.; Wilson, D.G. (eds.). (Oak Ridge National Lab., TN (USA)). Aug 1983. Contract W-7405-ENG-26. 103p. NTIS, PC A06/MF A01. Order Number DE83016958.

This report is the twenty-sixth in the series of progress reports of Mathematics and Statistics Research of the Computer Sciences organization, Union Carbide Corporation Nuclear Division. Part A records research progress in analysis of large data sets, applied analysis, biometrics research, computational statistics, materials science applications, numerical linear algebra, and risk analysis. Collaboration and consulting with others throughout the Oak Ridge Department of Energy complex are recorded in Part B. Included are sections on biological sciences, energy, engineering, environmental sciences, health and safety, and safeguards. Part C summarizes the various educational activities in which the staff was engaged. Part D lists the presentations of research results, and Part E records the staff's other professional activities during the report period.

50440 **(SAND—82-2981) User's guide to Sandia TEX.** Herrmann, W.; Blanford, M.L.; Sears, M.P. (Sandia National Labs., Albuquerque, NM (USA)). May 1983. Contract AC04-76DP00789. 124p. NTIS, PC A06/MF A01. Order Number DE83016763.

TEX is a powerful typesetting system, developed by D.E. Knuth at Stanford University, which is particularly suited to producing mathematical manuscripts. A set of macros to simplify the use of TEX, called Facil TEX, has been developed by M. Diaz of the same institution. These macros have been modified at Sandia National Laboratories to met local requirements. This manual has been designed to cover many of the features of TEX and Facil TEX. It has been written for the beginning user with no previous experience in TEX. However, it may also serve as a reference manual for the experienced user.

50441 **(SAND—83-1538C) Comments on the iterated knapsack attack.** Brickell, E.F. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 9p. (CONF-830831—2). NTIS, PC A02/MF A01. Order Number DE83016762.

From CRYPTO '83 conference; Santa Barbara, CA, USA (21 Aug 1983).

L. Adleman has proposed a three step method for breaking the iterated knapsack that runs in polynomial time and is linear in the number of iterations. In this paper, we show that the first step is possibly exponential in the number of iterations, and that the second and third steps are exponential even for only three iterations.

50442 **(SLAC—253) Interactive graphics for data analysis.** McDonald, J.A. (Stanford Linear Accelerator Center, CA (USA)). Aug 1982. Contract AC03-76SF00515. 69p. NTIS, PC A04/MF A01. Order Number DE83016637.

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This paper reports on work in a new branch of research in statistical methods: applications of interactive computer graphics. Several programs written for the Orion I workstation, an experimental computer graphics system built at the Stanford Linear Accelerator Center in 1980-1981, are described. These programs demonstrate new methods for data analysis made possible by advances in microprocessor and computer graphics technology. These methods make extensive use of color, real-time motion, and interaction to discover structure in many-dimensinal data. Two approaches to graphical analysis of many-dimensional data are discussed in detail: interactive projection pursuit and simultaneous, multiple views.

50443 **(UCID—19029-Rev.2) MAZE: an input generator for DYNA2D and NIKE2D.** Hallquist, J.O. (Lawrence Livermore National Lab., CA (USA)). Jun 1983. Contract W-7405-ENG-48. 117p. NTIS, PC A06/MF A01. Order Number DE83016415.

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MAZE is an interactive program that has been developed as an input generator for DYNA2D, NIKE2D, and possibly other codes through the standard grid link file, SGLF. The purpose of this report is to provide a user's manual.

50444 **(UCID—19847) Distributed operating system for cooperating functional processors.** Reiter, E.E.; Zimmerman, D.L. (Lawrence Livermore National Lab., CA (USA)). 1981. Contract W-7405-ENG-48. 80p. NTIS, PC A05/MF A01. Order Number DE83016015.

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The paper has been divided into several main chapters. This first chapter contains a discussion of the goals of the system, the architecture assumptions used, and the structure of FP. The next chapters present an overview and discussion of the service support layer processes, and other upper level supports for the partition of problems, parallel processing, and the implementation of the FP language. These chapters are the heart of the paper, in the sense that they deal with the possibility of an implementation of a parallel processor that accepts FP. The next chapter is a discussion of the kernel of the operating system. In this distributed system, this is the message passing system. It allows processes on the same or different nodes to communicate, and is thus the backbone of the entire system. Finally, we have included another chapter which reviews some of the issues covered in this system. For instance, we have included discussions of synchronization, resource allocation, and protection.

50445 (UCRL—52000-83-4, pp 27-35) **National Magneic Fusion Energy Computer Center.** Apr 1983. NTIS, PC A03/MF A01.

In Energy and Technology Review.

The NMFECC is a network that integrates 75 computers (from minicomputers to CRAY supercomputers) in a tiered arrangement that matches a problem's complexity with the level of computing power appropriate to solve that problem in the most efficient manner. The network development and capabilities are described. (GHT)

50446 **Numerical solution of partial differential equations-III, SYNSPADE 1975.** Hubbard, B. (ed.). New York, NY; Academic Press Inc. (1976). 499p. (CONF-750545—). Academic Press, Inc., 111 Fifth Ave., New York, NY 10003.

From Symposium on the numerical solution of partial differential equations; College Park, MD, USA (19 May 1975).

The symposium emphasized those difficult problems in partial differential equations exhibiting some type of singular behavior. Four individual papers were prepared for the data base. (GHT)

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REFER ALSO TO CITATION(S) 49275

50447 **(BNL-NCS—51665) Minutes of the sixth annual meeting of the Panel on Reference Nuclear Data .** Burrows, T.W.; Brenner, D.S. (eds.). (Brookhaven National Lab., Upton, NY (USA)). May 1983. Contract AC02-76CH00016. 27p. NTIS, PC A03/MF A01. Order Number DE83016767.

Biomedical data needs, fusion data needs, and reactor physics data needs are reviewed. The transfer of responsibilities and the status of ENSDF are discussed, and on-line data base systems are reviewed. Attendees and observers to the meeting are listed. (WHK)

50448 **(DOE/TIC—4584-R5) Subject categories with scope definitions and limitations.** Bost, D.E. (ed.). (Department of Energy, Oak Ridge, TN (USA). Technical Information Center). Aug 1983. 62p. NTIS, PC A04/MF A01. Order Number DE83008754.

Citations entered into DOE's computerized bibliographic information system are assigned six-digit subject category numbers to broadly group information for storage, retrieval, and manipulation. These numbers are used in the preparation of printed documents, such as bibliographies and abstract journals, to arrange the citations and to aid searching on the DOE/RECON on-line system. This document has been prepared for use by (1) those individuals responsible for the assignment of category numbers to documents being entered into the Technical Information Center (TIC) system, (2) those individuals and organizations processing magnetic tape copies of the files, (3) those individuals doing on-line searching for information in TIC-created files, and (4) others who, having no access to RECON, need a printed copy.

50449 **(SAND—83-0401C) Logbooks: a key to test/experiment data integrity.** Henderson, J.T. (Sandia National Labs., Albuquerque, NM (USA)). 1983. Contract AC04-76DP00789. 6p. (CONF-8305113—1). NTIS, PC A02/MF A01. Order Number DE83016158.

From American Society for Quality Control congress; Denver, CO, USA (21 May 1983).

The Waste Management and Transportation Directorate of Sandia National Laboratories (SNL) is applying a QA Program in accordance with DOE/AL Order 5700.6A to the acquisition of research and technology (R and T) data. This QA Program has recently placed emphasis on the importance of test/experiment logbooks to data integrity. This paper addresses the rationale as well as the entries (and supporting data) necessary for generating a complete and defensible logbook. Since such entries may be either of a one-time or repetitive nature, further distinctions and guidance are offered. This paper also addresses logbook maintenance, the time spent in documenting performance history may be lost or rendered ineffectual. Also, the human engineering of logbook generation is considered so that a structured format can be followed.

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Colorado Univ., Boulder (USA). Dept. of Anthropology
Final report of a class iii cultal resources inventory of potential coal production areas in North Park, Jackson County, Colorado. Report for Sep 77-Aug 78, 8:48564 (R;US)
Columbia Univ., New York (USA)
High-beta tokamak research. Annual progress report, 1 August 1982-1 August 1983, 8:50395 (R;US)
Columbia Univ., New York (USA). Dept. of Biochemistry
Biological and synthetic systems for production of hydrogen from water. Final report 1 Jun 80-31 Dec 82, 8:48764 (R;US)
Comision Nacional de Energia Atomica, Buenos Aires (Argentina)
Hydrogen damage in metals, particularly in steels, 8:49467 (R;AR;In Spanish)
Comissao Nacional de Energia Nuclear de Brasil, Rio de Janeiro
Proceedings of the Brazilian-German Symposium on Nuclear Reactor Safety, 8:50075 (R;BR)
Commission of the European Communities, Luxembourg
Construction of a photovoltaic cell based on the photoelectrochemistry of organic dyes at transparent semi-conducting electrodes. Final report, 8:48838 (R;XE)
Experimentelle untersuchungen zue kinetik der SO_3-spaltung bei hoeheren druecken und thermodynamische berechnung von spaltreaktoren (experimental investigations on the kinetics of the SO_3-cleavage at elevated pressures and thermodynamic calculations of cleavage reactors). Final report, 8:49586 (R;US)
Fabrication of highly active glasses using the cells VULCAIN and PIVER: leaching of certain of these glasses at three temperatures in the cell VULCAIN. Final report, 8:48676 (R;XE)
Long-term storage of radioactive kryston in pressure vessels; safety, 8:48643 (R;US)
Methane production by anaerobic digestion of algae. Final report, 8:48776 (R;XE)
Study of primary and associated reactions in photosynthesis, 8:49596 (R;US)
Synopsis of results of the first programme on the production and utilization of hydrogen within the energy R and D programme of the Commission of the European Communities (1975-79), 8:49267 (R;US)
Verfestigung alphahaltiger abfaelle in keramischer matrix Solidifying alpha-bearing wastes in a ceramic matrix. Final report, 8:48677 (R;US)
Commission of the European Communities, Luxembourg. Directorate-General for Science, Research and Development
Development of self-supplying solar cooling systems with concentrating collectors, 8:48908 (R;XE;In German)
Copenhagen Univ. (Denmark). H.C. Oersted Inst.
Extended solubility and martensitic hcp nickel formation in antimony implanted nickel, 8:49491 (R;DK)
Sputtering on cobalt with noble gas ions, 8:50151 (R;DK)
Cornell Univ., Ithaca, NY (USA)
Analysis of the economic impacts from ethanol production in three New York State regions. Final report, 8:48790 (R;US)
Council for Mineral Technology, Randburg (South Africa)
Determination by x-ray-fluorescence spectrometry of gold and uranium on resin, 8:49571 (R;ZA)
Preparation and certification of a uranium reference material, 8:49572 (R;US)

D

Delaware Univ., Newark (USA). Coll. of Marine Studies
Wind effects on longitudinal dispersion in open-channel flows. Final report, 8:49869 (R;US)
Delegationen foer Energiforskning, Stockholm (Sweden)
Energy research program 1978/79-1980/81. Survey of activities. General investigations and analysis. Summary of branch reviews, 8:49245 (R;SE;In Swedish)
Energy research program 1978/79-1980/81. Survey of the performance of the peat line, 8:48506 (R;SE;In Swedish)
Energy research program 1978/79-1980/81. Surveying the performance of the line wood-pulp-paper, 8:48816 (R;SE;In Swedish)

Energy research program 1978/79-1980/81. Surveying the performance of the line of advanced energy technology etc, 8:49249 (R;SE;In Swedish)
Energy research program 1978/79-1980/81. The treatment of environmental problems, 8:49247 (R;SE;In Swedish)
Energy research program. Survey of activities. General investigations and analysis. Summary of branch reviews, 8:49246 (R;SE;In Swedish)
Place of energy research programs in the different parts of the developmental process. Case stories, 8:49248 (R;SE;In Swedish)

Delta Inst. for Hydrobiological Research, Yerseke (Netherlands)
Sampling program on below-ground biomass and productivity in four salt marsh vegetation stands, 8:48839 (R;NL;In Dutch)

Denver Research Inst., CO (USA)
Pollution control technical manual: Lurgi oil shale retorting with open pit mining. Final report, 8:48621 (R;US)
Pollution control technical manual: modified 'in situ' oil shale retorting combined with Lurgi surface retorting. Final report, 8:48619 (R;US)
Pollution control technical manual: TOSCO 2 oil shale retorting with underground mining. Final report, 8:48620 (R;US)

Department of Energy, Oak Ridge, TN (USA). Technical Information Center
Subject categories with scope definitions and limitations, 8:50448 (R;US)

Department of Energy, Washington, DC (USA). Office of Industrial Programs
Economic thickness for industrial insulation, 8:49453 (R;US)

Department of Health and Human Services, Washington, DC (USA)
Process and device for x-ray system quality assurance, 8:49990 (P;US)

Department of Housing and Urban Development, Washington, DC (USA)
Congressional justification for 1983 estimates, US Department of Housing and Urban Development. Part 2: Solar Energy and Conservation Bank, Community Planning and Development, New Community Development Corporation, Policy Development and Research, Fair Housing and Equal Opportunity, 8:49286 (R;US)
Economic Commission for Europe, Committee on Housing, Building, and Planning: National Response Paper, 8:49333 (R;US)

Department of Housing and Urban Development, Washington, DC (USA). Building Technology Div.
Energy conserving features inherent in older homes, 8:49440 (R;US)

Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt e.V., Koeln (Germany, F.R.)
Effects on traffic of a magnetic levitation system Frankfurt -96 Paris, 8:49447 (R;DE;In German)

Deutsches Elektronen-Synchrotron (DESY), Hamburg (Germany, F.R.)
Impossibility of a scalar tachyon, 8:50207 (TG;DE)

Dialogue Systems, Inc., New York (USA)
Applying the cost-effective energy standards in rehabilitation projects, 8:49441 (R;US)

Donaldson Co., Inc., Minneapolis, MN (USA)
Development of improved scrubbers for coal mine applications. Contract research report sep 79-mar 82, 8:48565 (R;US)

Duke Power Co., Charlotte, NC (USA). Design Engineering Dept.
Feasibility study for adding a demand failure data collection system to the Nuclear Plant Reliability Data System. Final report, 8:49134 (R;US)

Duke Univ., Durham, NC (USA). Dept. of History
Development of a data base for carbon dioxide releases resulting from conversion of land to agricultural uses, 8:49834 (R;US)

Du Pont de Nemours (E.I.) and Co., Aiken, SC (USA). Savannah River Lab.
Dissolution of plutonium metal in HNO_3-N_2H_4-KF, 8:48640 (R;US)
Neptunium (IV) oxalate solubility, 8:49579 (R;US)

Du Pont de Nemours (E.I.) and Co., Aiken, SC (USA). Savannah River Plant
Chloride removal from plutonium alloy, 8:48641 (R;US)
Solvent purification with high-porosity (macroreticular) ion-exchange resin, 8:48642 (R;US)

Duquesne Univ., Pittsburgh, PA (USA). Dept. of Chemistry
Hydrogen bonding in asphaltenes and coal liquids. Quarterly report, May 1-July 31, 1983, 8:48510 (R;US)

E

Eastern Kentucky Univ., Richmond (USA). Dept. of Geology
Petrographic characterization of Kentucky coals: relationship between sporinite spectral fluorescence and coal rank of selected western Kentucky coals. Final report, Part I, 8:48529 (R;US)

Ecolotrol, Inc., Bethpage, NY (USA)
Anaerobic fluidized bed treatment of whey: effect of organic loading rate, temperature and substrate concentration, 8:48767 (R;US)

EG and G Idaho, Inc., Idaho Falls (USA)
Determination of radium-226 by high-resolution alpha spectrometry, 8:49560 (R;US)
FRAP-T6: a computer code for the transient analysis of oxide fuel rods, 8:49190 (R;US)
Fusion Safety Program. Annual report, FY 1982, 8:50397 (R;US)
Implementation plan for the TRU Waste-Sampling Program, 8:48660 (R;US)
Improved low-level radioactive waste management practices for hospitals and research institutions, 8:48659 (R;US)
Radioactive waste management information, 1982 summary and record-to-date, 8:48663 (R;US)
Radioactive waste management information for 1982, 8:48664 (R;US)
Risk assessment of a fusion-reactor fuel-processing system, 8:50398 (R;US)
Summary of Nuclear Regulatory Commission's LOFT Program experiments, 8:49193 (R;US)
Thermal and hydraulic performance tests of a sieve-tray direct-contact heat exchanger vaporizing pure and mixed-hydrocarbon Rankine-cycle working fluids, 8:48931 (R;US)
Variation of Ge detector efficiency with source diameter and radial source position, 8:49741 (R;US)

EG and G, Inc., Goleta, CA (USA)
Crystal growth and applications of mercuric iodide. Report S-242-TP, 8:49739 (R;US)

Ehrenkrantz Group, Washington, DC (USA)
Energy conservation for housing: a workbook, 8:49434 (R;US)

ELETROBRAS, Rio de Janeiro (Brazil). Dept. de Estudos Energeticos
Nuclear fuel. Availability, demand and cost, 8:49045 (R;BR;In Portuguese)

Employment and Training Administration, Washington, DC (USA). Unemployment Insurance Service
Effect of the state laws and economic factors on exhaustion rates for regular unemployment benefits: a statistical model, 8:49239 (R;US)
Financing America's unemployment compensation program. Technical staff paper 4, 8:49235 (R;US)

Energetics, Inc., Columbia, MD (USA)
Assessment of private-sector cogeneration models, 8:49451 (R;US)

Energiforskningsnaemnden, Stockholm (Sweden)
Energy decisions. Pt. 2: Analysis and appendices. A collation of knowledge based on research as a basis for decisions on energy systems, 8:49229 (R;SE;In Swedish)
Energy decisions. Pt.1: Synthesis. A collation of knowledge based on research as a basis for decisions on energy systems, 8:49228 (R;SE;In Swedish)

Energy Research Corp., Bethel, CT (USA)
Analysis of SAC (separate air cooled) design. Final report, 8:49331 (R;US)

Engineering Science, Inc., Fairfax, VA (USA)
Development of a permitting strategy for a coal-fired heating plant, K.I. Sawyer AFB, Maine. Final report for period ending Sep 82, 8:49854 (R;US)

Environmental Protection Agency, Cincinnati, OH (USA). Industrial Environmental Research Lab.
Pollution control technical manual: Lurgi oil shale retorting with open pit mining. Final report, 8:48621 (R;US)

Environmental Protection Agency, Cincinnati, OH (USA). Municipal Environmental Research Lab.
Impact of coal refuse disposal on groundwater. Final report 1975-79, 8:48543 (R;PL)

Environmental Protection Agency, Research Triangle Park, NC (USA). Emission Standards and Engineering Div.
Costs of particulate matter controls for nonfossil fuel fired boilers. Final report, 8:49240 (R;US)
Environmental Protection Agency, Research Triangle Park, NC (USA). Industrial Environmental Research Lab.
Cleaned coal. Report for Jul 81-Jan 83, 8:48578 (R;US)
Pollution Control Technical Manual for Exxon Donor Solvent direct coal liquefaction. Final report Apr 82-Oct 82, 8:48546 (R;US)
Pollution Control Technical Manual for Koppers-Totzek based indirect coal liquefaction. Final report Jun 82-Feb 83, 8:48547 (R;US)
Pollution Control Technical Manual for Lurgi-based indirect coal liquefaction and SNG (substitute natural gas). Final report Jun 82-Feb 83, 8:48545 (R;US)
Environmental Research and Technology, Inc., Pittsburgh, PA (USA)
Influence of coal devolatilization conditions on the yield, chemistry, and toxicology of by-product oils and tars, 8:48584 (R;US)
Erevanskij Fizicheskij Inst. (USSR)
Exact solution of the problem of phase transitions in the two-level model, 8:50317 (R;SU;In Russian)
Lorentz-invariance and vacuum fields, 8:50227 (R;SU)
Reflection spectra of silicon carbide in vacuum ultraviolet region, 8:49532 (R;SU)
ESG, Inc., Atlanta, GA (USA)
Comparison of the analytically developed and field-measured overall conductive heat-transfer coefficients in passive-solar residential construction, 8:48905 (R;US)
Guide for commercial water-heating applications, 8:49417 (R;US)
European Organization for Nuclear Research, Geneva (Switzerland)
Study of high-mass e^+e^- pairs at the CERN ISR, 8:50163 (R;US)
Exxon Nuclear Idaho Co., Inc., Idaho Falls (USA)
Airborne radionuclide waste-management reference document, 8:48661 (R;US)

F

Federal Aviation Administration, Atlantic City, NJ (USA). Technical Center
Compatibility study of antimisting kerosene and the DC-10/KC fuel system. Final report Mar 81-Apr 82, 8:49458 (R;US)
Federal Aviation Administration, Washington, DC (USA). Office of Systems Engineering Management
Potential fuel savings of specific ATC system improvements. Final report, 8:49445 (R;US)
Fermi National Accelerator Lab., Batavia, IL (USA)
Thousand TeV in the center of mass: introduction to high-energy storage rings, 8:49732 (R;US)
Florida Univ., Gainesville (USA). Aquatic Plants Research Center
Recording fathometer techniques for hydrilla distribution and biomass studies. Final report, 8:49868 (R;US)
Florida Univ., Gainesville (USA). Dept. of Chemistry
Radiation chemistry of hydrocarbon and alkyl halide systems. Progress report, August 1, 1982-July 31, 1983, 8:49601 (R;US)
Florida Univ., Gainesville (USA). Dept. of Physics
Axions in cosmology, 8:50180 (R;US)
Florida Univ., Gainesville (USA). Engineering and Industrial Experiment Station
Separators for lithium alloy-iron sulfide fused-salt batteries. Final report, 8:49222 (R;US)
Florida Univ., Gainesville (USA). Solar Energy Lab.
Investigation of mobile homes for air conditioning and heating performance: evaluation of Zone 1 mobile home thermal envelopes. Report, 8:49437 (R;US)
Florida Univ., Gainesville (USA). Space Astronomy Lab.
Studies of nuclei far from stability in the A approx. mass region. Progress report, 1 August 1982-30 June 1983, 8:50255 (R;US)
Foersvarets Forskningsanstalt, Sundbyberg (Sweden)
Radioactive fallout from nuclear weapons: a review of airborn transport, effects and measures), 8:49863 (R;US)
Freie Univ. Berlin (Germany, F.R.). Fachbereich Humanmedizin
Primary radiotherapy of mammary carcinomas: Mammographic findings in course control, 8:49959 (R;DE;In German)

G

Gas Research Inst., Chicago, IL (USA)
Economic and systems assessment of the concept of nearshore kelp farming for methane production. Final report Jun 82-May 83, 8:48777 (R;US)
Electron transfer and ion pair formation during oxidation and gasification of coal. Annual report Feb 82-Feb 83, 8:48518 (R;US)
Gas saturation in formation waters. volume i. Final report mar 79-aug 82, 8:48938 (R;US)
Identification of safety related research and development needs for CNG (compressed natural gas) vehicle fuel systems. Final report Dec 82-Mar 83, 8:48610 (R;US)
Microbiological and chemical studies on the anaerobic conversion of coal-derived compounds to methane. Annual report Feb 82-Feb 83, 8:48519 (R;US)
Trends in the supply and price of residual fuel oil in the United States energy system. Final report, 8:48604 (R;US)
GA Technologies, Inc., San Diego, CA (USA)
Ideal-MHD beta limits: scaling laws and comparison with Doublet III high-beta plasmas, 8:50400 (R;US)
Magnetic fluctuations in high-β/sub p/ tokamak plasmas, 8:50399 (R;US)
GCA Corp., Bedford, MA (USA)
Coal preparation survey. Final report Feb 82-Aug 82, 8:48577 (R;US)
Geo-Centers, Inc., Newton Upper Falls, MA (USA)
Progress report: oxidation stability studies of deuterated esters. Memorandum report, 8:49588 (R;US)
Geological Survey, Denver, CO (USA)
Sourcebook of locations of geophysical surveys in tunnels and horizontal holes including results of seismic-refraction surveys: Rainier Mesa, Aqueduct Mesa, and Area 16, Nevada Test Site, 8:50094 (R;US)
Georgia Inst. of Tech., Atlanta (USA)
Kinetic study of radical-aromatic hydrocarbon reactions. Progress report covering August 1, 1982-April 15, 1983, 8:49590 (R;US)
Georgia Inst. of Tech., Atlanta (USA). School of Nuclear Engineering and Health Physics
Neutral-beam-driven impurity flow reversal in tokamaks, 8:50375 (R;US)
Gesamthochschule Duisburg (Germany, F.R.). Fachgebiet Nachrichtentechnik, Grundgebiete und Bauelemente der Nachrichtentechnik
Problems of automatic fire detection, 8:49645 (R;DE;In German)
Gesellschaft fuer Reaktorsicherheit m.b.H. (GRS), Garching (Germany, F.R.)
14. informal meeting on reactor noise. Abstracts, 8:49173 (R;DE)
Gesellschaft fuer Reaktorsicherheit m.b.H. (GRS), Koeln (Germany, F.R.)
Transport of radioactive materials within the nuclear fuel cycle, 8:48654 (TG;GB)
Gesellschaft fuer Schwerionenforschung m.b.H., Darmstadt (Germany, F.R.)
4π data of relativistic nuclear collisions, 8:50280 (R;US)
Results obtained using the Plastic Ball, 8:50264 (R;US)
Giessen Univ. (Germany, F.R.). Fachbereich Humanmedizin
Investigations of the tracheobronchial epithelium of rat after X-ray irradiation and inhalation of ^{212}Pb aerosol, 8:50029 (R;DE;In German)
Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Moscow. Inst. Teoreticheskoj i Ehksperimental'noj Fiziki
Higher orders of the perturbation theory and summation of perturbational series in quantum mechanics, 8:50349 (R;SU)
Hydrogen atom in external fields. Arbitrary constant magnetic field (the Zeeman effect), 8:50149 (R;SU)
Integration over Fermi fields in chiral and supersymmetric theories, 8:50241 (R;SU)
Quantum mechanics. A fresh look on old perturbation theory, 8:50348 (R;SU;In Russian)
Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Serpukhov. Inst. Fiziki Vysokikh Ehnergij
Absence of free quarks in QCD in the framework of perturbation theory, 8:50240 (R;SU;In Russian)

Analysis of reaction $\nu sub(\mu)p \rightarrow \mu^- p\pi^+$ in the theory of broken chiral symmetry, 8:50217 (R;SU)
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Charm production in π^- p interactions in parton model, 8:50186 (R;SU;In Russian)
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One-long QCD corrections for nonleptonic $\Delta S = 0$ weak Hamiltonian in sic-quark models, 8:50214 (R;SU)
Self-consistent chiral doublet composite scheme, 8:50216 (R;SU)
Study of interference correlations between likely-charged pions in anti pp interactions at 32 GeV/c, 8:50165 (R;SU;In Russian)

Graz Univ. (Austria)
Deuteron form factors and e-d polarization observables for the Paris and Graz-II potentials, 8:50194 (R;AT)
Sensitivity of N-d polarization observables on the off-shell behavior of the N-N interaction, 8:50195 (R;AT)

Gulf Research and Development Co., Pittsburgh, PA (USA)
Surface properties of offretite and ZSM-34 zeolites, 8:49581 (R;US)

H

Hamburg Univ. (Germany, F.R.). Fachbereich Biologie
Transport and degradation of 2-^{14}C abscicine acid in the Coleus rehneltianus berger sprout, 8:49928 (R;DE;In German)

Hanford Engineering Development Lab., Richland, WA (USA)
Fast Flux Test Facility emergency planning, 8:49136 (R;US)

Hebrew Univ., Jerusalem (Israel)
Fourth international conference on photochemical conversion and storage of solar energy, 8:48817 (R;IL)

Hebrew Univ., Jerusalem (Israel). School of Applied Science and Technology
Crystal growth and applications of mercuric iodide. Report S-242-TP, 8:49739 (R;US)

Holmes and Narver, Inc., Las Vegas, NV (USA). Energy Support Div.
Project Gasbuggy site restoration. Final report, 8:49813 (R;US)

Hungarian Academy of Sciences, Budapest. Central Research Inst. for Physics
Confinement of dynamic quarks, 8:50244 (R;HU)
Hadron spectrum calculations at strong coupling in lattice QCD, 8:50190 (R;HU)
Influence of production process on imperfection structure of metallic glasses studied by positron annihilation, 8:49512 (R;HU)
KNO distributions using the generalization of Novero-Predazzi's ansatz with three constraints, 8:50189 (R;HU)
Short range order in $(Ni_{65}Fe_{35})_{77}B_{23}$ metallic glass by neutron diffraction, 8:49513 (R;HU)

I

Illinois Dept. of Energy and Natural Resources, Springfield (USA)
Analysis of selected problems related to transportation of Illinois coal, 8:48576 (R;US)

Illinois Inst. of Natural Resources, Champaign (USA). State Geological Survey Div.
Murphysboro coal, Jackson and Perry counties: resources with low to medium sulfur potential. Illinois mineral notes, 8:48550 (R;US)

Illinois Univ., Urbana (USA)
Application of multivariate source/receptor models to aerosol mass apportionment, 8:49828 (R;US)
Intercalate phonon densities of states for alkali-graphite compounds, 8:49549 (R;US)

Illinois Univ., Urbana (USA). Coordinated Science Lab.
FEMA (Federal Emergency Management Agency) database requirements assessment and resource directory model. Final report 24 Aug 81-15 May 82, 8:50074 (R;US)

Illinois Univ., Urbana (USA). Dept. of Civil Engineering
Analysis of selected problems related to transportation of Illinois coal, 8:48576 (R;US)

Illinois Univ., Urbana (USA). Dept. of Physics
Phonon dispersion of transverse basal-plane modes in alkali-graphite compounds, 8:49550 (R;US)

Illinois Univ., Urbana (USA). Fusion Studies Lab.
Gyroscopic stabilization of a spheromak plasma configuration, 8:50373 (R;US)

Illinois Univ., Urbana (USA). Water Resources Center
Alternative structures for water rights markets: overview and hypothetical case study, 8:49901 (R;US)
Post-mining neutralization of acid surface mine lakes, 8:48548 (R;US)

Independex, Inc., Dallas, TX (USA)
Magneto-electric exploration. Final technical progress report, 8:48591 (R;US)

Indiana Univ., Bloomington (USA). Dept. of Chemistry
Radical chain and rearrangement reactions in coal liquefaction. Progress report, 8:48507 (R;US)

Inhalation Toxicology Research Inst., Albuquerque, NM (USA)
Vehicle-emission characteristics using mechanically emulsified alcohol/diesel fuels, 8:49463 (R;US)

Innsbruck Univ. (Austria). Inst. fuer Radiochemie und Angewandte Physikalische Chemie
Alumina as a thermoluminescent material for personnel dosimetry, 8:49748 (R;AT;In German)

Institute for Petroleum Research and Geophysics, Holon (Israel)
Electrical resistivity survey in the northeastern Golan Heights (geothermal project), 8:48926 (R;IL)
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Institute of Gas Technology, Chicago, IL (USA)
Gas saturation in formation waters. Final report Mar 79-Aug 82, 8:48939 (R;US)
Solar-assisted hydrogen generation by photoelectrocatalysis. Final report mar 81-may 82, 8:48765 (R;US)

Institute of Physics and Nuclear Techniques, Krakow (Poland)
Wandering probe for tightness testing of the gas pipelines by means of the radiotracer method, 8:49627 (R;PL;In Polish)

Instituto Militar de Engenharia, Rio de Janeiro (Brazil)
Criticality safety of pipe systems which contain solutions of fissile materials, 8:49623 (R;BR;In Portuguese)

Instituto Peruano de Energia Nuclear, Lima. Centro de Informacion y Documentacion
Design of an information and documentation center for the Peruvian Institute of Nuclear Energy, 8:48963 (R;PE;In Spanish)

International Atomic Energy Agency, Vienna (Austria)
Assessment in rodents of the pathological and immunopathological consequence of multiple vaccinations and challenge with radiation-attenuated malaria parasites (blood forms and sporozoites). Final report for the period 1 May 1979 - 31 May 1982, 8:50011 (R;XA)
Charged particle cross-section data and their systematization. Final report for the period 1 November 1979 - 30 November 1981, 8:50278 (R;XA)
Comparative study of the N metabolism of phytoplankton and periphyton communities in oligotrophic lakes. Part of a coordinated programme on isotopic-tracer-aided research and monitoring on agricultural residue - biological interactions in aquatic ecosystems. Final report for the period 1 July 1977 - 30 June 1982, 8:49880 (R;XA)
Integrated study of labelled contaminant or substrate-biological species interactions in a selected aquatic ecosystem. Part of a coordinated programme on isotopic-tracer aided research and monitoring on agricultural residue - biological interactions in aquatic ecosystems. Final report for the period 1 July 1976 - 30 June 1982, 8:49874 (R;XA)
Measurement and prediction of soil biological processes resulting in denitrification. Part of a coordinated programme on isotopic tracer-aided studies of agrochemical residue - soil biota interactions. Final report for the period 1 April 1978 - 30 November 1982, 8:49856 (R;XA)

Planning for off-site response to radiation accidents in nuclear facilities. Safety series No. 55, 8:48739 (R;XE)
Transuranic cycling behaviour in the marine environment. Final report of the co-ordinated research programme sponsored by the IAEA from 1979 to 1981, 8:49881 (R;XA)
International Atomic Energy Agency, Vienna (Austria). International Nuclear Data Committee
Energy dependence of the average number of prompt neutrons resulting from the neutron fission of U236, 8:50292 (R;XA)
What we do and not know about electron impact excitation of atomic hydrogen, 8:50145 (R;XA)
International Atomic Energy Agency, Vienna (Austria). Nuclear Data Section
ENDF/B-V processing programs. Description and operating instructions, 8:50257 (R;XA)
RESPAR3 and RESPAR3ED Libraries. Resonance parameters from BNL-325 (3rd Ed. 1973). Content and format description, 8:50256 (R;XA)
SPOTS4. Group data library and computer code, preparing ENDF/B-4 data for input to LEOPARD, 8:50308 (R;XA)
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International Centre for Theoretical Physics, Trieste (Italy)
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Iowa State Univ. of Science and Technology, Ames (USA)
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Iowa State Univ. of Science and Technology, Ames (USA). Energy and Mineral Resources Research Inst.
Critical evaluation of binary-rare-earth phase diagrams. Progress report, September 1, 1982-February 28, 1983, 8:49485 (R;US)
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Measuring irradiation creep. Simulation of fusion-neutron induced damage by beams of light ions from an accelerator. Technical note, 8:49471 (R;IL)
Istituto Nazionale di Fisica Nucleare, Frascati (Italy). Lab. Nazionale di Frascati
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JAYCOR, San Diego, CA (USA)
Numerical simulation of steam separators used in nuclear steam generators and reactor systems. Volume 2. User's manual, 8:48986 (R;US)

Jet Propulsion Lab., Pasadena, CA (USA)
Experimental process-system development unit for producing semiconductor-grade silicon using the silane-to-silicon process. Flat-plate solar-array project. Phase III final report, April 1979-December 1981, 8:48833 (R;US)
New algorithm for constrained nonlinear least-squares problems. Part I, 8:50371 (R;US)
Proceedings of the flat-plate solar-array workshop on the science of silicon-material preparation, 8:48818 (R;US)
Proceedings of the US Department of Energy Photovoltaics Program annual review, 8:48801 (R;US)
Vehicle test report: South Coast Technology electric Volkswagen Rabbit with developmental low-power armature chopper, 8:49459 (R;US)

Johns Hopkins Univ., Laurel, MD (USA). Applied Physics Lab.
Systems study of regional air transport modeling for emergency response applications, 8:49120 (R;US)

Joint FAO/IAEA Div. of Isotope and Radiation Applications of Atomic Energy for Food and Agricultural Development, Vienna (Austria)
Semi-dwarf cereal mutants and their use in cross-breeding. Proceedings of a research co-ordination meeting organized by the Joint FAO/IAEA Division of Isotope and Radiation Applications of Atomic Energy for Food and Agricultural Development and held in Vienna, 2-6 March 1981, 8:50018 (R;XA)
Use of isotopes to detect moderate mineral imbalances in farm animals. Results of a co-ordinated research programme on the use of isotope techniques for detection of moderate mineral imbalances in farm animals organized by the Joint FAO/IAEA Division of Isotope and Radiation Applications of Atomic Energy for Food and Agricultural Development and presented at a research co-ordination meeting held in Nicosia, Cyprus, 6-10 October 1980, 8:49999 (R;XA)

Joint Inst. for Nuclear Research, Dubna (USSR). Dept. of New Acceleration Methods
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Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation
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Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy
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Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Neutron Physics
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Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems
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Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Reactions
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Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics
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Joyce (T.) Associates, Inc., Fairfax, VA (USA)
Identification of safety related research and development needs for CNG (compressed natural gas) vehicle fuel systems. Final report Dec 82-Mar 83, 8:48610 (R;US)

Junta de Energia Nuclear, Madrid (Spain)
Study of the properties of ribulose 1,5 biphosphate carboxilase oxygenase from maize (Zea mays) and wheat (Triticum aestivum) by incorporation of $^{14}CO_2$, 8:49915 (R;ES;In Spanish)

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Kaman Tempo, Santa Barbara, CA (USA)
Prototype computer-interactive goundwater monitoring methodology: an example for sedimentation ponds. Proj. report 1979-81, 8:48544 (R;US)

Karas (James E.), Columbus, OH (USA)
Ohio No. 2 fuel oil price-monitoring survey, 1982-1983 heating season. Final report, 8:49452 (R;US)

Kentucky Univ., Lexington (USA)
Petrographic characterization of Kentucky coals: relationship between sporinite spectral fluorescence and coal rank of selected western Kentucky coals. Final report, Part I, 8:48529 (R;US)

Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.)
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Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Projekttraegerschaft Fertigungstechnik
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Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Schule fuer Kerntechnik
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Ktech Corp., Albuquerque, NM (USA)
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KVB, Inc., Irvine, CA (USA)
Control of nitrogen oxides: assessment of needs and options. Volume 5. Emissons control technology for combustion sources. Technical support document. Final report, 8:49830 (R;US)

L

Laboratorium voor Isotopen-Geologie, Amsterdam (Netherlands)
Condensed report of activities in the period September 1980 to the end of 1981, 8:50086 (R;NL;In Dutch)
Landesanstalt fuer Immissionsschutz des Landes Nordrhein-Westfalen, Essen (Germany, F.R.)
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Technical-evaluation report on the proposed technical-specification changes for the inservice surveillance of safety-related hydraulic and mechanical snubbers at the Maine Yankee Nuclear Power Plant (Docket No. 50-309), 8:49003 (R;US)
Technical-evaluation report on the proposed technical-specification changes for the inservice surveillance of safety-related hydraulic and mechanical snubbers at the Haddam Neck Nuclear Power Plant (Docket No. 50-213), 8:49004 (R;US)
Technical-evaluation report on the proposed technical-specification changes for the inservice surveillance of safety-related hydraulic and mechanical snubbers at the Indian Point Nuclear Power Plant, Unit 3 (Docket No. 50-286), 8:49005 (R;US)
Technical-evaluation report on the proposed technical-specification changes for the inservice surveillance of safety-related hydraulic and mechanical snubbers at the Millstone Nuclear Power Station, Unit 2 (Docket No. 50-336), 8:49006 (R;US)
Technical-evaluation report on the proposed technical-specification changes for the inservice surveillance of safety-related hydraulic and mechanical snubbers at the James A. Fitzpatrick Nuclear Power Plant (Docket No. 50-333), 8:48981 (R;US)
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Techniques for precision air-temperature control, 8:49635 (R;US)
Theoretical and experimental studies of shock-compressed benzene and polybutene, 8:49592 (R;US)
Thermal performance of the MFTF magnets, 8:50416 (R;US)
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US energy flow, 1982, 8:49231 (R;US)
X-ray streak crystal spectography, 8:50387 (R;US)
Yield stress and strain-rate sensitivity of nickel over a wide temperature range, 8:49504 (R;US)

Lehigh Univ., Bethlehem, PA (USA). Dept. of Chemistry
Determination of the surface reactivity of coal powders. Third quarterly report, March 1, 1983-May 31, 1983, 8:48530 (R;US)

Los Alamos National Lab., NM (USA)
Calculated response contributions of gamma rays emitted from fuel pins in an irradiated PWR fuel assembly, 8:48999 (R;US)
Fuel models and results from the TRAC-PF1/MIMAS TMI-2 accident calculation, 8:49186 (R;US)
Isotope and Nuclear Chemistry Division annual report FY 1982, October 1981-September 1982, 8:49617 (R;US)
Multi-isotopic gamma-ray assay system for alpha-contaminated waste, 8:48670 (R;US)
Numerical calculations of hydrogen-air combustion, 8:49187 (R;US)
Precise ultrahigh-pressure experiments, 8:49465 (R;US)
Preliminary results from ZT-40M using active feedback for equilibrium control, 8:50402 (R;US)
Progress at LAMPF: Clinton P. Anderson Meson Physics Facility. Progress report, January-December 1982, 8:50260 (R;US)
Quasi-free scattering of pions on ^{3} ^{4}He, 8:50267 (R;US)
Reflected shocks in SiO_2, 8:49514 (R;US)
Research and development related to the Nevada Nuclear Waste Storage Investigations. Progress report, July 1-September 30, 1982, 8:48669 (R;US)
Space Nuclear-Safety Program progress report, February 1983, 8:48761 (R;US)
Special functions and group theory in theoretical physics, 8:50245 (R;US)
Study on diffusion of the vertical magnetic field in the toroidal stabilizing shell of the ZT-40M reversed-field-pinch device, 8:50401 (R;US)
Three-dimensional computer modeling of a shock-recovery experiment, 8:49492 (R;US)
TRAC-PD2 posttest analysis of the CCTF Evaluation-Model Test C1-19 (Run 38), 8:49197 (R;US)

Louisiana State Univ., Baton Rouge (USA). Dept. of Petroleum Engineering
Investigations of enhanced oil recovery through use of carbon dioxide. Seccnd annual report, October 1, 1981-September 30, 1982, 8:48594 (R;US)

Loyola Univ., Chicago, IL (USA). Dept. of Physics
Theory of hyperfine anomalies in muonic atoms, 8:50117 (R;US)

Lummus Co., Bloomfield, NJ (USA)
Advancement of peat hydrogasification. Final report, July 1983, 8:48515 (R;US)

M

Magma Gulf/Technadril, Houston, TX (USA)
Geopressured well project Sweet Lake, Cameron Parish, Louisiana. Final report Feb 80-Sep 82, 8:48928 (R;US)

Maine Office of Energy Resources, Augusta (USA)
Home-heating-oil price-monitoring report, June 1982-May 1983, 8:48601 (R;US)

Manyam and Associates, Inc., Lansing, MI (USA)
Ingham County Geriatric Medical Care Facility solar water-heating system refurbishments. Final technical report, 8:48907 (R;US)
Ingham County Medical Care Facility solar energy project (Engineering Materials), 8:48904 (E;US)
Operational and maintenance instruction manual for the Ingham County Geriatric Medical Care Facility solar water-heating system, 8:48906 (R;US)

Maryland Dept. of Natural Resources, Annapolis (USA). Power Plant Siting Program
Bibliography of the Maryland Power Plant Siting Program, fourth edition, 8:48958 (R;US)

Wind effects on longitudinal dispersion in open-channel flows. Final report, 8:49869 (R;US)
Massachusetts Inst. of Tech., Cambridge (USA)
Crossed reaction networks in the catalytic hydrodenitrogenation of synthetic liquid fuels. Quarterly report, May 1, 1983-July 31, 1983, 8:48509 (R;US)
Low-temperature and neutron-physics studies. Progress report, July 1982-June 1983, 8:50307 (R;US)
Massachusetts Inst. of Tech., Cambridge (USA). Plasma Fusion Center
Active stabilization and start-up coil characteristics, 8:50393 (R;US)
Coil and shell characteristics for passive stabilization, 8:50372 (R;US)
Model for stresses in circular magnets for toroidal fusion devices, 8:50392 (R;US)
12-T solenoid-design options for the MFTF-B Upgrade, 8:50394 (R;US)
Mathematical Sciences Northwest, Inc., Bellevue, WA (USA)
Advanced-laser development for isotope separation. Final report, 8:48629 (R;US)
Mathematica Policy Research, Princeton, NJ (USA)
Effect of the state laws and economic factors on exhaustion rates for regular unemployment benefits: a statistical model, 8:49239 (R;US)
Max-Planck-Institut fuer Kernphysik, Heidelberg (Germany, F.R.)
Phenomenology of deep-inelastic processes, 8:50281 (R;US)
Max-Planck-Institut fuer Radioastronomie, Bonn (Germany, F.R.)
Neutron-transmutation-doped germanium bolometers, 8:49781 (R;US)
McDonnell Douglas Corp., Long Beach, CA (USA)
Compatibility study of antimisting kerosene and the DC-10/KC fuel system. Final report Mar 81-Apr 82, 8:49458 (R;US)
Mellon Inst., Pittsburgh, PA (USA)
Influence of coal devolatilization conditions on the yield, chemistry, and toxicology of by-product oils and tars, 8:48584 (R;US)
Michigan State Univ., East Lansing (USA)
Study of high-mass e^+e^- pairs at the CERN ISR, 8:50163 (R;US)
Michigan Technological Univ., Houghton (USA)
Effects of increasing costs on the future relation between open pit and underground mining. Volume 1. Open file report (final) 1 Sep 80-20 Dec 81, 8:48568 (R;US)
Effects of increasing costs on the future relation between open pit and underground mining. Volume 2. Open file report (final) 1 Sep 80-20 Dec 81, 8:48569 (R;US)
Michigan Technological Univ., Houghton (USA). Dept. of Geology and Geological Engineering
Active metasomatism in the Cerro Prieto geothermal system, Baja California, Mexico: a telescoped low pressure/temperature metamorphic facies series, 8:48922 (R;US)
Calc-silicate mineralization in active geothermal systems, 8:48923 (R;US)
Michigan Univ., Ann Arbor (USA). Architectural and Planning Research Lab.
Solarization/Conservation Technology Development Program for existing housing. Part II. Final report, 8:49422 (R;US)
Michigan Univ., Ann Arbor (USA). Dept. of Physics
83-inch cyclotron research program. Final report, 8:49675 (R;US)
Minas Gerais Univ., Belo Horizonte (Brazil). Dept. de Engenharia Nuclear
Environmental radiocontamination. Search for ^{210}Po And ^{226}Ra in air and in water, 8:49843 (R;BR;In Portuguese)
Mine Safety and Health Administration, Arlington, VA (USA)
Explosion hazard in mining, 8:50081 (R;US)
Regional enforcement of mine safety and health regulations and miner education and training in the Federal Republic of Germany, 8:48556 (R;US)
Mine Safety and Health Administration, Denver, CO (USA). Health and Safety Analysis Center
Design guidelines for coal-refuse piles and water, sediment, or slurry impoundments and impounding structures, 8:48557 (R;US)
Injury experience in metallic mineral mining, 1978, 8:50080 (R;US)
Radon-daughter growth with continuous radon influx and various ventilation rates, 8:49846 (R;US)
Mine Safety and Health Administration, Pittsburgh, PA (USA). Pittsburgh Technical Support Center
Evaluation of two light-scattering respirable dust monitors, 8:48587 (R;US)
Frictional ignition of methane by continuous-mining machines in underground coal mines, 8:48558 (R;US)
Impact of the metal/nonmetal Special Accident-Prevention Program for fiscal year 1976, 8:50079 (R;US)
Improving barrier insertion loss, 8:50072 (R;US)
Operational analysis of point resin-anchored bolting systems, 8:49652 (R;US)
Mining Enforcement and Safety Administration, Arlington, VA (USA). Coal Mine Health and Safety
Compilation of judicial decisions which have an impact on coal-mine inspections, 8:48589 (R;US)
Meeting mandatory federal health standards under difficult dust-control conditions, 8:48586 (R;US)
Mining Enforcement and Safety Administration, Arlington, VA (USA). Metal and Nonmetal Mine Health and Safety
Application of statistics to radiation surveys in mines, 8:49845 (R;US)
Mining Enforcement and Safety Administration, Denver, CO (USA). Denver Technical Support Center
Calibration procedures for radon and radon-daughter measurement equipment, 8:49760 (R;US)
Fan curve preparation using programmable pocket calculators, 8:49651 (R;US)
Mine engineering and ventilation problems unique to the control of radon daughters, 8:48626 (R;US)
Mine-ventilation pressure differentials with a programmable hand calculator: a supplement to Bureau of Mines Information Circulars 7809 and 8594, 8:49650 (R;US)
Monitoring and warning instrumentation of pillar movements in salt, 8:48555 (R;US)
Mining Enforcement and Safety Administration, Denver, CO (USA). Health and Safety Analysis Center
Analysis of injuries involving jackleg rock drills underground, 1973-1974, 8:50076 (R;US)
Injury experience in the metallic mineral industries, 1973, 8:50077 (R;US)
Injury experience in the sand and gravel industry, 1974, 8:50078 (R;US)
Mining Enforcement and Safety Administration, Morgantown, WV (USA). Coal Mine Health and Safety District 3
Methods factors for anemometer readings at tubing inlets, 8:49807 (R;US)
Review of published experimental calibrations performed on the 10-millimeter nylon cyclone, 8:49806 (R;US)
Mining Enforcement and Safety Administration, Mt. Hope, WV (USA). Coal Mine Health and Safety
Panic bars and automatic brakes, 8:49646 (R;US)
Mining Enforcement and Safety Administration, Norton, VA (USA). Coal Mine Health and Safety
Wet auger: respirable-dust control for underground auger continuous-mining machines, 8:49833 (R;US)
Mining Enforcement and Safety Administration, Pittsburgh, PA (USA). Approval and Certification Center
Permissible electric face equipment and other mine equipment approved from January 1969-December 1974, 8:48553 (R;US)
Mining Enforcement and Safety Administration, Pittsburgh, PA (USA). Pittsburgh Technical Support Center
Investigation of the effects of thrust and hardened washers on the installed tension of a roof bolt, 8:49649 (R;US)
Methods factors for anemometer readings at tubing inlets, 8:49807 (R;US)
Mine-ventilation pressure differentials with a programmable hand calculator: a supplement to Bureau of Mines Information Circulars 7809 and 8594, 8:49650 (R;US)
Review of published experimental calibrations performed on the 10-millimeter nylon cyclone, 8:49806 (R;US)
Standard calibration and maintenance procedures for wet test meters and coal-mine respirable-dust samplers, 8:49808 (R;US)
Summary of some selected underground coal-mine-face-machinery fatalities-1973, 8:48585 (R;US)
Ventilation to control the smoke from a fireproof structure, 8:48554 (R;US)
Mining Enforcement and Safety Administration, Richlands, VA (USA). Coal Mine Health and Safety District 5
Meeting mandatory federal health standards under difficult dust-control conditions, 8:48586 (R;US)

Mining Enforcement and Safety Administration, Washington, DC (USA). Coal Mine Health and Safety
Wet auger: respirable-dust control for underground auger continuous-mining machines, 8:49833 (R;US)

Ministerium fuer Wirtschaft, Mittelstand und Verkehr des Landes Nordrhein-Westfalen, Duesseldorf (Germany, F.R.)
Fields of application for small HTR reactors, 8:49257 (R;DE;In German)

Minnesota Univ., Minneapolis (USA). Dept. of Mechanical Engineering
Hydrogen and sulfur from hydrogen sulfide. II. Ambient temperature electrolysis using oxidation of hydrogen sulfide by air as the prime energy source. Interim report 1 jul 82-31 oct 84, 8:48762 (R;US)

Mission Research Corp., Alexandria, VA (USA)
Catalog of the existing short range experiment (SRE) data base (addendum to NOAA (National Oceanic and Atmospheric Administration) Technical Memorandum ERL ARL-80). Technical memo, 8:49836 (R;US)

Missouri Univ., Columbia (USA). Water Resources Research Center
Simplified scheme for the analysis of pollutants in groundwater and leachates contaminated by hazardous chemicals, 8:49570 (R;US)

Mitre Corp., McLean, VA (USA). METREK Div.
Potential fuel savings of specific ATC system improvements. Final report, 8:49445 (R;US)

Mobil Research and Development Corp., Paulsboro, NJ (USA)
Slurry Fischer-Tropsch/Mobil two-stage process of converting syngas to high-octane gasoline. Quarterly report, 1 October-31 December 1982, 8:48769 (R;US)

Monsanto Research Corp., Miamisburg, OH (USA). Mound
Calorimeter operating system implemented on a Z-80 microcomputer in read only memory, 8:49569 (R;US)

Moskovskij Gosudarstvennyj Univ. (USSR)
Proceedings of the 7. International conference on atomic collisions in solids. Volume 2, 8:50147 (R;SU)

Mueller Associates, Inc., Baltimore, MD (USA)
Energy technology characterizations handbook: environmental pollution and control factors. Third edition, 8:49908 (R;US)

Muenchen Univ. (Germany, F.R.). Fachbereich Medizin
Accuracy of abdominal lymph node scintigraphy in tumor diagnostics, 8:49988 (R;DE;In German)
Enzyme histochemical and autoradiographic studies of the influence of partial hepatectomy on the induction of liver tumors by diethylnitrosamine (DENA). II. Effect of proliferation stimulation in the late stage of DENA feeding, 8:50066 (R;DE;In German)

Muenchen Univ. (Germany, F.R.). Fakultaet fuer Medizin
Comparative study of unilateral renal tubule function using ^{131}I-o-hippuran and sup(99m)Tc-dimercaptosuccinic acid with regard to renal depth and excretion relations, 8:49957 (R;DE;In German)
Elaboration of a radicligand receptor assay for TSH and thyroid-stimulating immunoglobulins, 8:49989 (R;DE;In German)
Study of the reactivation of X-ray inactivated lambda bacteriophages by irradiated Escherichia coli bacteria, 8:50033 (R;DE;In German)

N

National Academy of Sciences - National Research Council, Washington, DC (USA)
Controlled nuclear fusion: current research and potential progress. Supporting paper no. 3, 8:50407 (R;US)

National Aeronautics and Space Administration, Cleveland, OH (USA). Lewis Research Center
DOE large horizontal-axis wind-turbine development at NASA Lewis Research Center, 8:48945 (R;US)

National Aeronautics and Space Administration, Greenbelt, MD (USA). Goddard Space Flight Center
Type 2 radio bursts, interplanetary shocks and energetic particle events, 8:50107 (R;US)

National Aeronautics and Space Administration, Washington, DC (USA)
Determination of the temperature of a dense plasma from a spectral line shift, 8:50377 (R;US)

National Bureau of Standards, Washington, DC (USA). Center for Building Technology
Performance analysis of the Jersey City total energy site: final report, 8:49435 (R;US)
Performance analysis of the Jersey City total energy site: executive summary, 8:49436 (R;US)
Thermal radiative ignition of liquid fuels by a CO_2 laser. Final report 1 Oct 79-30 Sep 82, 8:48609 (R;US)

National Center for Appropriate Technology, Butte, MT (USA)
Wastes to resources: appropriate technologies for sewage treatment and conversion, 8:49454 (R;US)

National Center for Devices and Radiological Health, Rockville, MD (USA)
Role of the U.S. Public Health Service in radiological health: 1946-1969, 8:50036 (R;US)

National Inst. for Occupational Safety and Health, Cincinnati, OH (USA)
Good practice manual for insulation installers, 8:50083 (R;US)
Health and safety guide for oil and gas well drilling and servicing, 8:48599 (R;US)
National Institute for Occupational Safety and Health certified equipment list as of February 17, 1983, 8:48588 (R;US)
Program of the National Institute for Occupational Safety and Health: program plans by program areas for fiscal year 1981, 8:50082 (R;US)

National Inst. for Occupational Safety and Health, Cincinnati, OH (USA). Div. of Physical Sciences and Engineering
Pilot control technology assessment of chemical reprocessing and reclaiming facilities. Walk-through survey report of Solvent Resource Recovery, Inc., West Carrollton, Ohio, 8:50084 (R;US)

National League of Cities, Washington, DC (USA)
Model Solar Document project. Final report, 8:48797 (R;US)

National Marine Fisheries Service, Seattle, WA (USA)
Economic analysis of fishing industry energy conservation technology, 8:49234 (R;US)

National Mine Health and Safety Academy, Beckley, WV (USA)
Compilation of judicial decisions which have an impact on coal-mine inspections, 8:48589 (R;US)

National Radiological Protection Board, Harwell (UK)
Environmental radioactivity surveillance programme: results for the UK for 1981, 8:49861 (R;GB)

National Research Council of Canada, Ottawa, Ontario. Div. of Biological Sciences
Performance characteristics of anaerobic downflow stationary fixed film reactors, 8:48766 (R;US)

National Research Council, Washington, DC (USA). Committee on Evaluation of Enewetak Radioactivity Containment
Evaluation of Enewetak radioactivity containment. Final report, 8:48678 (R;US)

National Science Foundation, Washington, DC (USA)
Biological and synthetic systems for production of hydrogen from water. Final report 1 Jun 80-31 Dec 82, 8:48764 (R;US)

Nauchno-Issledovatel'skij Inst. Atomnykh Reaktorov, Dimitrovgrad (USSR)
Modules for small computerized measuring systems on the base of the Vector crate, 8:49809 (R;SU;In Russian)

Naval Civil Engineering Lab., Port Hueneme, CA (USA)
Assessment of seafloor burial of proposed OTEC power-transmission cables, 8:48901 (R;US)
Water-in-oil emulsion as a boiler fuel. Final report Oct 81-Sep 82, 8:48608 (R;US)

Naval Ocean Systems Center, San Diego, CA (USA)
Lithium-thionyl chloride batteries - past, present and future, 8:49219 (R;US)

Naval Postgraduate School, Monterey, CA (USA)
Decision models for conducting an economic analysis of alternative fuels for the ice engine. Master's thesis, 8:49461 (R;US)

Naval Research Lab., Washington, DC (USA)
Frequency and distribution of natural and pollutant organic sea slicks. Memorandum report, 8:49870 (R;US)
Progress report: oxidation stability studies of deuterated esters. Memorandum report, 8:49588 (R;US)
Use of induced spatial incoherence for uniform illumination on laser fusion targets. Memorandum report, 8:50389 (R;US)

Nebraska Univ., Lincoln (USA). Dept. of Agricultural Biochemistry
Biochemical and physiological characterization of higher plants with reduced photorespiration. Progress report, May 25, 1981-August 1, 1983, 8:49918 (R;US)
Nevada Univ., Reno (USA). Center for Water Resources Research
Preliminary analysis of precipitation in southern Nevada, 8:49818 (R;US)
Nevada Univ., Reno (USA). Seismological Lab.
Seismic discrimination at regional distance. Final report 1 Oct 81-30 Sep 82, 8:49817 (R;US)
New Mexico Inst. of Mining and Technology, Socorro (USA)
Investigation of microbially induced permeability loss during in-situ leaching. Contract research report 23 feb 81-15 jul 82, 8:48627 (R;US)
New Mexico Univ., Albuquerque (USA)
Bibliography with abstracts of geological literature pertaining to southern Nevada with particular reference to the Nevada Test Site, 8:48684 (R;US)
New Mexico Univ., Albuquerque (USA). Dept. of Chemical and Nuclear Engineering
Specific surface measurements of shock-modified powders, 8:49515 (R;US)
New Mexico Univ., Albuquerque (USA). Dept. of Geology
Evaluation of the geothermal resource in the area of Albuquerque, New Mexico, 8:48924 (R;US)
New York State Energy Research and Development Authority, Albany (USA)
Analysis of the economic impacts from ethanol production in three New York State regions. Final report, 8:48790 (R;US)
New York State Geological Survey, Albany (USA)
Microseismic monitoring for evidence of geothermal heat in the capital district of New York. Final report, Phases I-III, 8:48925 (R;US)
Niels Bohr Inst., Copenhagen (Denmark)
Fermionic strings with boundary terms. II. The O(2) string, 8:50191 (R;DK)
Lorentz invariance as a low energy phenomenon, 8:50356 (R;DK)
Physical anomaly on the lattice, 8:50246 (R;DK)
Nordel Planning Committee
Nordenergi 2020. Some viewpoints of Scandinavian electric cooperation with glances at the rest of the energy sector, 8:49233 (R;SE;In Swedish)
North Carolina Univ., Chapel Hill (USA). Dept. of Physics and Astronomy
Research in theoretical physics, 8:50179 (R;US)
North Central Forest Experiment Station, St. Paul, MN (USA)
Establishing intensively cultured hybrid poplar plantations for fuel and fiber. Forest Service general technical report (final), 8:48837 (R;US)
North Dakota Water Resources Research Inst., Fargo (USA)
Investigation of coupled simulation methods for North Dakota space heating-cooling scenarios using groundwater. Technical completion report Jan 81-Sep 82, 8:49433 (R;US)
Northwestern Univ., Evanston, IL (USA). Dept. of Physics and Astronomy
Theory of hyperfine anomalies in muonic atoms, 8:50117 (R;US)
Norton Construction Co., Independence, OH (USA)
Feasibility study for utilization of landfill gas at the Royalton Road Landfill, Broadview Heights, Ohio. Final report, 8:48773 (R;US)
Notre Dame Univ., IN (USA). Dept. of Aeronautical and Mechanical Engineering
Influence of combustion on Reynolds stress in a strongly heated turbulent boundary layer, 8:49638 (R;US)
Notre Dame Univ., IN (USA). Dept. of Metallurgical Engineering and Materials Science
Microstructural effects in abrasive wear. Second annual progress report, August 10, 1982-August 12, 1983, 8:49469 (R;US)
Nuclear Power Co. (Risley) Ltd. (UK)
Application of co-axial thermocouples in the SOMITE facility, 8:49803 (R;GB)
Application of MI cable to measure temperatures in a sodium heat transfer experiment, 8:49075 (R;GB)
Development of mineral insulated cable for nucleonic instrumentation, 8:49801 (R;GB)
Differential thermocouples and gamma detectors, 8:49800 (R;GB)
Influence of thermal cycling on coaxial thermocouple performance, 8:49795 (R;GB)
Insulation degradation in long, mineral insulated metal sheathed thermocouples, 8:49057 (R;GB)
Magnesium oxide as a high-temperature insulant in M.I. thermocouples, 8:49799 (R;GB)
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Manufacture of thermocouple cables and probes, 8:49798 (R;GB)
Mineral insulated thermocouples - installation in steam generating plant, 8:49013 (R;GB)
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Novel temperature sensors developed at BNL using mineral insulated cable, 8:49796 (R;GB)
Rapid response sensor to monitor the temperature and flow of liquid metals, 8:49794 (R;GB)
Reliability of thermocouples in the Windscale AGR, 8:49012 (R;GB)
Source of EMF's in thermocouple circuits, 8:49792 (R;GB)
Temperature measurement in the chemical industry, 8:49591 (R;GB)
Temperature transient response measurement in flowing water, 8:49793 (R;GB)
Thermocouples in pressurised water rigs, 8:49152 (R;GB)
Nuclear Regulatory Commission, Washington, DC (USA)
Overview of the MELCOR risk code development program, 8:49207 (R;US)
Nuclear Regulatory Commission, Washington, DC (USA). Office of Inspection and Enforcement
Licensed-fuel-facility status report: inventory difference data, July 1982-December 1982. Vol. 3, No. 2, 8:48746 (R;US)
Nuclear Regulatory Commission, Washington, DC (USA). Office of Nuclear Reactor Regulation
Safety-evaluation report related to the operation of Diablo Canyon Nuclear Power Plants, Units 1 and 2. Docket Nos. 50-275 and 50-323. Supplement No. 18, 8:49188 (R;US)
Safety-evaluation report related to the renewal of the operating license for the Cornell University TRIGA Research Reactor. Docket No. 50-157, 8:49189 (R;US)
Nuclear Regulatory Commission, Washington, DC (USA). Office of Resource Management
Summary Information report. Vol. 2, No. 3, 8:49042 (R;US)
Topical report review status, July 15, 1983. Vol. 7, No. 1, 8:48973 (R;US)
NUCLEBRAS, Belo Horizonte (Brazil)
Preliminary studies on fluid inclusions in metasomatic albite grains from Lagoa Real, Caetite, Ba, Brazil, 8:50097 (R;BR;In Portuguese)

O

Oak Ridge Associated Universities, Inc., TN (USA)
Development of a data base for carbon dioxide releases resulting from conversion of land to agricultural uses, 8:49834 (R;US)
International carbon dioxide-related activities: the international organizations involved and US bilateral arrangements, 8:49829 (R;US)
Oak Ridge National Lab., TN (USA)
Assessing the risks from exposure to radon in dwellings, 8:50034 (R;US)
Assessment of potential health effects of light-duty diesel exhaust, 8:50067 (R;US)
Bulk Shielding Facility quarterly report, January, February, and March 1983, 8:49130 (R;US)
Case studies: developing land uses in surface-mine reclamation, 8:49867 (R;US)
Characterization of an aged WESF capsule, 8:48757 (R;US)
Chemical characterization and toxicologic evaluation of airborne mixtures: chemical characterization of combusted inventory red and violet smoke mixes, 8:49835 (R;US)
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CHMONE: a one-dimensional computer code for simulating temperature, flow, and chemical concentrations in water bodies, 8:49876 (R;US)

Confidence limits for the expectation of a Poisson variable: figures and tables, 8:49857 (R;US)
Design options to test the effects of financial incentives in a utility conservation program: TVA's heat-pump water-heater program, 8:49431 (R;US)
Development of a data base for carbon dioxide releases resulting from conversion of land to agricultural uses, 8:49834 (R;US)
Effects of hydrotreatment on the properties of coal-derived liquid products: a status report, 8:48517 (R;US)
Effects of temperature and nutritional state on the toxicity of acridine to the calanoid copepod, Diaptomus clavipes Schacht, 8:50068 (R;US)
Electron-microscope observation of crack propagation and a dislocation model of fracture, 8:49468 (R;US)
Environmental compliance guide: guidance manual for Department of Energy compliance with the National Historic Preservation Act, 8:49909 (R;US)
Equilibrium and stability properties of high-beta torsatrons, 8:50379 (R;US)
Estimation of health risks from radiation exposures, 8:50035 (R;US)
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Fates of Aromatics Model (FOAM): description, application, and analysis, 8:49873 (R;US)
Front-end analysis for the nuclear-power-plant maintenance-personnel reliability model, 8:48974 (R;US)
High-temperature gas-cooled reactor safety studies for the division of accident evaluation. Quarterly progress report, October 1-December 31, 1982, 8:49191 (R;US)
Implications of heavy-ion induced satellite x-ray emission. I. Introduction, 8:50118 (R;US)
Implications of heavy-ion-induced satellite x-ray emission. III. Chemical effects in high resolution sulfur K/sub α/ x-ray spectra, 8:50119 (R;US)
Influence of redox and Lewis-acid functions of $SbCl_3$-rich molten-salt catalysts on the reactions of coal-model compounds, 8:49589 (R;US)
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Mathematics and statistics research progress report, period ending June 30, 1983 , 8:50439 (R;US)
Methodology for allocating nuclear power plant control functions to human or automatic control, 8:49113 (R;US)
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Procedures and technology for shallow-land burial. Low-level radioactive-waste-management handbook series, 8:48658 (R;US)
Proceedings of the workshop on electricity demand forecasting by state agencies, 8:49273 (R;US)
Role of the oceans in the carbon cycle, 8:49871 (R;US)
Superconductor stability, 1983: a review, 8:50391 (R;US)
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Oak Ridge Y-12 Plant, TN (USA)
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Oat (Joseph) Corp., Camden, NJ (USA)
Effect of nonuniform inlet air flow on air-cooled heat-exchanger performance, 8:49018 (R;US)

O'Brien and Gere Engineers, Inc., Syracuse, NY (USA)
Radisson community heating systems: technical and economic comparison of options. Final report, 8:49432 (R;US)

Oekonomiske Raad, Copenhagen (Denmark). Formandskabet
MSGE. Energy in a multi-sector growth model for Denmark. Supplement to the report "Danish economy and the energy problems", 8:49232 (R;DK;In Danish)

Oesterreichisches Forschungszentrum Seibersdorf G.m.b.H. Inst. fuer Biologie
DNA-repair and chromatin. Int. symp. Saalfelden 1981, 8:49914 (R;AT)

Office of Radiation Programs, Washington, DC (USA)
Background information document proposed standards for radionuclides. Draft report, 8:49855 (R;US)
Regulatory impact analysis of environmental standards for uranium mill tailings at active sites. Final report, 8:48675 (R;US)

Office of Water Research and Technology, Washington, DC (USA)
Alternative structures for water rights markets: overview and hypothetical case study, 8:49901 (R;US)
Analysis of irrigation pumping and application efficiency in the central Ogallala formation, 8:49243 (R;US)
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Wind energy for low head irrigation. Report for Oct 79-Sep 82, 8:48946 (R;US)

Ohio State Univ., Columbus (USA). Dept. of Chemistry
Kinetics of growth and decay of excited rare-gas atoms and molecules in the pulse radiolysis of pure rare gases and of mixtures of rare gases with molecular quenching agents, 8:50140 (R;US)

Ohio State Univ., Columbus (USA). Dept. of Physics
Gauge boson masses and lepton mixing in 0(4) x U(1) gauge model, 8:50178 (R;US)

Ohio State Univ. Research Foundation, Columbus (USA)
Development of an in-situ method for testing neutron sensors used in nuclear-power-plant reactor-protection systems. Final report, September 1981-September 1982, 8:49072 (R;US)

Oklahoma Water Resources Research Inst., Stillwater (USA)
Analysis of irrigation pumping and application efficiency in the central Ogallala formation, 8:49243 (R;US)

Oregon State Univ., Corvallis (USA)
Effect of low-proof fuel alcohol on crankcase oil dilution in an Otto-cycle engine. Final report, 8:49462 (R;US)

Oregon State Univ., Corvallis (USA). Dept. of Physics
Quasi-free scattering of pions on ^{3} ^{4}He, 8:50267 (R;US)

Oregon Univ., Eugene (USA)
Charm production in the valon model, 8:50182 (R;US)
Connection between QCD and Regge intercept, 8:50183 (R;US)
Grand unification and strong CP problem, 8:50226 (R;US)
Recent developments in the valon model, 8:50184 (R;US)

Oxford Univ. (UK)
Study of high-mass e^+e^- pairs at the CERN ISR, 8:50163 (R;US)

P

Pace Co. Consultants and Engineers, Inc., Houston, TX (USA)
Trends in the supply and price of residual fuel oil in the United States energy system. Final report, 8:48604 (R;US)

Pacific Northwest Lab., Richland, WA (USA)
Allowable residual-contamination levels for decommissioning facilities in the 100 areas of the Hanford Site, 8:48680 (R;US)
Aquatic Pathways Model to predict the fate of phenolic compounds. Appendixes A through D, 8:48520 (R;US)
Biofouling of power-plant service systems by Corbicula, 8:49073 (R;US)
Catalytic gasification studies in a pressurized fluid-bed unit, 8:48778 (R;US)
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Guide for effluent radiological measurements at DOE installations, 8:49841 (R;US)
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Long-term leaching of two simulated waste glasses, 8:48683 (R;US)
MAP3S precipitation chemistry network: sixth periodic summary report (1982), 8:49837 (R;US)
MASTER: a forecast model of reginal economic activity, 8:49236 (R;US)
Parametric calculations of fatigue-crack growth in piping, 8:49200 (R;US)
Porous media reservoir stability criteria for compressed-air energy storage, 8:49217 (R;US)
Reactor safety research programs. Volume 1. Quarterly report, January-March 1983, 8:49195 (R;US)
Regional impacts of increasing energy prices, 8:49237 (R;US)
Residential energy use and improved building thermal efficiency: an econometric analysis, 8:49443 (R;US)
Status of radioiodine control for nuclear fuel reprocessing plants, 8:48679 (R;US)
Status of radionuclide sorption-desorption studies performed by the WRIT program, 8:48681 (R;US)
Technology, safety, and costs of decommissioning a reference pressurized-water-reactor power station: effects on decommissioning of interim inability to dispose of wastes offsite, 8:49043 (R;US)
Test application of a semi-objective approach to wind forecasting for wind-energy applications, 8:48947 (R;US)
Transport of tracers and pollutants from the Geysers Geothermal Resource Area, 8:49824 (R;US)
TRAN-STAT statistics for environmental studies, issue No. 24, August 1983. Field sampling designs, simple random and stratified random sampling, 8:49825 (R;US)
Waste glass/metal interactions in brines, 8:48682 (R;US)
Pakistan Inst. of Nuclear Science and Technology, Rawalpindi. Health Physics Div.
Determination of internal contamination of uranium by urine analysis, 8:50037 (R;PK)
Environmental levels of gamma emitting radionuclides at PINSTECH. Period 1979-1980, 8:49762 (R;PK)
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Paris-11 Univ., 91 - Orsay (France)
Designing and developing a low temperature irradiation experimental device. Study of the effects of electronic irradiation on type N indium arsenide, 8:49533 (R;FR;In French)
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Studies and comparisons of two photon-tagging systems for the production of monochromatic photon beams for photonuclear experiments, 8:49672 (R;FR;In French)
Parsons (Ralph M.) Co., Pasadena, CA (USA)
Economic and systems assessment of the concept of nearshore kelp farming for methane production. Final report Jun 82-May 83, 8:48777 (R;US)
Patton (James B.), Durango, CO (USA)
Interconnecting dc-energy systems: responses to technical issues, 8:48899 (R;US)
Pennsylvania State Univ., University Park (USA)
Design procedures for coal mine tunnels. Open file report 1 Oct 79-31 Dec 82 (final), 8:48563 (R;US)
Properties of reactive species generated at high temperatures and their low temperature reactions to form novel substances. Final report, 8:49575 (R;US)
Selected papers on fuel forecasting and analysis, 8:48956 (R;US)
Pennsylvania Univ., Philadelphia (USA)
Enzymatic conversion of unusual cellulosic wastes to alcohol fuel. Alcohol-Fuels Grant Program, 8:48787 (R;US)
Pennsylvania Univ., Philadelphia (USA). Dept. of Mechanical Engineering and Applied Mechanics
Effect of nonuniform inlet air flow on air-cooled heat-exchanger performance, 8:49018 (R;US)
Perkins and Will, Inc., Washington, DC (USA)
Energy conservation for housing: a workbook, 8:49434 (R;US)
Princeton Univ., NJ (USA). Plasma Physics Lab.
Experimental control of the spheromak tilting instability, 8:50382 (R;US)
FED-R: a fusion engineering device utilizing resistive magnets, 8:50408 (R;US)
Fishbone and internal kinks, 8:50383 (R;US)
Purdue Univ., Hammond, IN (USA)
Engineering aspects of magnetohydrodynamics, 8:49289 (R;US)
Purdue Univ., Lafayette, IN (USA)
Detection and location of incipient faults on power cables. Final report, 8:49643 (R;US)
Purdue Univ., Lafayette, IN (USA). Dept. of Chemistry
Comparisons between theoretical and experimental deuterium isotope effects for some outer-sphere electrochemical reactions. Technical report, 8:49574 (R;US)
Purdue Univ., Lafayette, IN (USA). Ray W. Herrick Labs.
Seasonal performance of air conditioners - an analysis of the DOE test procedures: time constants and the performance of a heat pump in the cooling mode, 8:49419 (R;US)
Seasonal performance of air conditioners: experimental analysis of some of the DOE test-procedure set-up measurement errors for unitary air conditioners and heat pumps, 8:49418 (R;US)
Seasonal performance of air conditioners: the effect of frost formation on the performance of a parallel-plate heat exchanger, 8:49420 (R;US)
Purdue Univ., Lafayette, IN (USA). School of Chemical Engineering
$CO + H_2$ reaction over nitrogen-modified iron catalysts. Quarterly technical progress report, April 1, 1983-June 30, 1983, 8:48771 (R;US)
Purdue Univ., Lafayette, IN (USA). Thermophysical and Electronic Properties Information Center
Thermophysical properties of matter, the TPRC data series. Volume 10. Thermal diffusivity. Data book, 8:49576 (R;US)

R

Radian Corp., Austin, TX (USA)
Pollution Control Technical Manual for Lurgi-based indirect coal liquefaction and SNG (substitute natural gas). Final report Jun 82-Feb 83, 8:48545 (R;US)
Radian Corp., Durham, NC (USA)
Costs of particulate matter controls for nonfossil fuel fired boilers. Final report, 8:49240 (R;US)
RAND Corp., Santa Monica, CA (USA)
Freeze: the literature of the nuclear weapons debate, 8:49254 (R;US)
Regensburg Univ. (Germany, F.R.). Naturwissenschaftliche Fakultaet 3 - Biologie und Vorklinische Medizin
Molecular mechanisms induced by the effects of ionizing radiation on nucleic acids: Free radicals in 5-halogenated uracil derivatives after reaction of radiolysis products of water in low-temperature glass, 8:50031 (R;DE;In German)
Research and Management Technicians, Inc., Gaithersburg, MD (USA)
Technology assessment for energy conversion and conservation. Final report, 8:49332 (R;US)
Resource Planning Associates, Inc., Cambridge, MA (USA)
Potential for industrial cogeneration development to defer new-utility electric-power capacity over the next decade, 8:49455 (R;US)

RE/SPEC, Inc., Rapid City, SD (USA)
Preliminary investigation of the thermal and structural influence of ventilation drifts on repository rooms, 8:48673 (R;US)
Rijksinstituut voor Drinkwatervoorziening, The Hague (Netherlands)
De afvlakking van temperatuurvariaties in het grondwater door warmte uitwisseling tussen het watervoerende pakket en de boven- en ondergelegen pakketten (Dampening of fluctuations in groundwater temperature by heat exchange between the aquifer and the adjacent layers), 8:49218 (R;US)
Rio Blanco Oil Shale Co., Aurora, CO (USA)
Development of a slurry filling system for modified in situ oil shale mining. Open file report 28 Sep 79-30 Jun 82, 8:48622 (R;US)
Risoe National Lab., Roskilde (Denmark)
Contribution of Risoe National Laboratory to the research development programs of the Danish Ministry of Energy. Status per September 1982, 8:49252 (R;DK;In Danish)
Environmental radioactivity in Greenland in 1981, 8:49865 (R;DK)
Environmental radioactivity in the Faroes in 1981, 8:49864 (R;DK)
Experimental and theoretical investigation of inverse annular film flow and dispersed droplet flow, important under LOCA conditions, 8:49201 (R;DK)
Physics Department annual progress report. 1 January - 31 December 1981, 8:50100 (R;DK)
Response times of operators in a control room, 8:49114 (R;DK)
Statistical theory on the turbulent diffusion of Gaussian puffs, 8:49847 (R;DK)
Table of exposure rate constants and dose equivalent rate constants, 8:50315 (R;DK)
Rockefeller Univ., New York (USA)
Comparison between p anti p and pp interactions at the ISR for high p/sub T/ and E/sub T/° spectra, 8:50162 (R;US)
Performance of a high-pressure hydrogen TPC, 8:49740 (R;US)
Study of high-mass e^+e^- pairs at the CERN ISR, 8:50163 (R;US)
Rockwell International Corp., Canoga Park, CA (USA). Energy Systems Group
Advancement of peat hydrogasification. Final report, July 1983, 8:48515 (R;US)
Foam process for application of decontamination agents, 8:49602 (R;US)
Friske, W.H.; Schwartzbart, H., 8:48932 (R;US)
Practical technological benefits of SRE decommissioning, 8:49125 (R;US)
Rockwell International Corp., Canoga Park, CA (USA). Energy Technology Engineering Center
OTEC-1 test operations experience. Final report, 8:48902 (R;US)
Rockwell International Corp., Golden, CO (USA). Rocky Flats Plant
Removal of nitrates from groundwater by reverse osmosis, 8:49878 (TG;US)
Rutgers--the State Univ., Piscataway, NJ (USA). Waksman Inst. of Microbiology
Mechanisms of mutagenesis-analysis through the use of alcohol dehydrogenase in drosophila. Progress report, 8:49917 (R;US)

S

Sandia National Labs., Albuquerque, NM (USA)
Analytic model for predicting dryout and quench behavior in a volumetrically heated particle bed, 8:49210 (R;US)
Approach to modeling of human performance for purposes of probabilistic risk assessment, 8:49202 (R;US)
Assessment of the proposed rule (10CFR60) for disposal of high-level radioactive wastes in geologic repositories. Volume I, 8:48671 (R;US)
Bibliography with abstracts of geological literature pertaining to southern Nevada with particular reference to the Nevada Test Site, 8:48684 (R;US)
Carbon piezoresistive stress gauge, 8:49810 (R;US)
Characterization of an aged WESF capsule, 8:48757 (R;US)
Coal-liquefaction-process research. Quarterly report, January 1-March 30, 1983, 8:48522 (R;US)
Comments on the iterated knapsack attack, 8:50441 (R;US)
CONTAIN: recent highlights in code testing and validation, 8:49209 (R;US)
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Effects of pressure on deep electronic levels in semiconductors, 8:49554 (R;US)
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Logbooks: a key to test/experiment data integrity, 8:50449 (R;US)
MEDICI reactor cavity model, 8:49208 (R;US)
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New algorithm for constrained nonlinear least-squares problems. Part I, 8:50371 (R;US)
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Portable self-contained aqueous foam system for generating high-expansion foam, 8:48747 (R;US)
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Radiation testing of the CMOS 8085 microprocessor family, 8:49782 (R;US)
RELAP5 assessment: Semiscale natural-circulation tests S-NC-2 and S-NC-7, 8:49194 (R;US)
Remaining uncertainties in predicting the coolability limits of a degraded reactor core, 8:49211 (R;US)
Response of the Watts Bar, Maine Yankee and Bellefonte containments to static internal pressurization, 8:49203 (R;US)
Role of ex-vessel core retention in severe-accident mitigation, 8:49204 (R;US)
Simple ideal gas model of the Pavlovskii high-explosive opening switch, 8:49634 (R;US)
Specific surface measurements of shock-modified powders, 8:49515 (R;US)
Status of PBFA II engineering, 8:50413 (R;US)
Tenth photovoltaic concentrator project integration meeting, Albuquerque, New Mexico, April 6 & 7, 1983, 8:48840 (R;US)
Thermal/hydraulic analysis research program quarterly report, January-March 1983, 8:49196 (R;US)
Thermal-hydraulic process modeling in risk analysis: an assessment of the relevant phenomena, 8:49206 (R;US)
Toward telegraphy in recruiting brochures, 8:50428 (R;US)
Tubular battery and transistorized controller outdoor laboratory test program, 8:49460 (R;US)
User's guide to Sandia TEX, 8:50440 (R;US)
School of Aerospace Medicine, Brooks AFB, TX (USA)
Delayed effects of proton irradiation in Macaca mulatta. II. Mortality (15-year report). Interim report 1964-1982, 8:50003 (R;US)
Schweizerisches Inst. fuer Nuklearforschung, Villigen
Search for admixture of massive neutrinos in the decay, $\pi \rightarrow \mu$ nu, 8:50161 (R;US)
Science and Engineering Research Council, Daresbury (UK). Daresbury Lab.
Recent developments in electron-atom and electron-molecule collision processes. Proceedings of the Daresbury Study Weekend, 26-27 March, 1982, 8:50139 (R;GB)
Science Applications, Inc., Bethesda, MD (USA)
Interim reliability evaluation program: analysis of the Millstone Point Unit 1 Nuclear Power Plant. Volume II. Appendix A and B.1 through B.4, 8:49192 (R;US)
Science Applications, Inc., Irvine, CA (USA)
Preliminary analysis of a carbon/carbon-fiber-composite plasma direct converter, 8:50409 (R;US)

Science Applications, Inc., La Jolla, CA (USA)
Design of superheated-steam-producing blanket for a d-d tokamak, 8:50410 (R;US)
Science Applications, Inc., La Jolla, CA (USA). Applied Plasma Physics and Technology Div.
Alternate fuels in fusion reactors, 8:50412 (R;US)
d-d tandem-mirror reactor with central-cell potential modification, 8:50411 (R;US)
Design of a high-temperature first wall/blanket for a d-d compact Reversed-Field-Pinch reactor (CRFPR), 8:50390 (R;US)
Preliminary analysis of a carbon/carbon-fiber-composite plasma direct converter, 8:50409 (R;US)
Science Applications, Inc., McLean, VA (USA)
Energy consumption impacts of site tailoring of mobile homes for energy efficiency. Topical report, 8:49438 (R;US)
Sensitivity analysis of mobile home space conditioning energy requirements to selection of U-values in twelve climates and cost/benefit analysis of U-values proposed for the federal manufactured housing construction (FMHC) and safety standards (SS), 8:49439 (R;US)
Science Research Council, Chilton (UK). Rutherford and Appleton Labs.
New approach to spectrum calculations in lattice Hamiltonian field theories. 1. Introduction and application to lambda phi^4 in (1+1) dimensions, 8:50247 (R;GB)
Qanti-QG hermaphrodite mesons in the MIT bag model, 8:50192 (R;GB)
RMS program system and database, 8:49763 (R;GB)
Weak decays of new particles, 8:50172 (R;GB)
Sentralinstitutt for Industriell Forskning, Oslo (Norway)
Analysis of petroleum hydrocarbons in intertidal organisms exposed to Ekofisk crude oil, 8:49996 (R;NO)
Determination of sulfate reducing bacteria in sea bottom samples, 8:49997 (R;NO)
Development of a new method for monitoring crack formation in offshore structures. Status report - invitation to participate, 8:48600 (R;NO)
Flexible cylinder in ocean waves, 8:48941 (R;NO)
Near field diffraction of two dimensional waves, 8:48942 (R;NO)
Numerical model for the frictional absorption of water waves, 8:48940 (R;NO)
Oil spill combat: Damage assessment using multiattribute utility analysis, 8:48606 (R;NO)
Shannon and Wilson, Inc., Seattle, WA (USA)
Remote monitoring of a coal waste impoundment in West Virginia. Open file report Oct 78-Sep 81, 8:48541 (R;US)
SINTEF, Trondheim (Norway)
IEA Task VIII: Passive and hybrid solar low energy buildings. National research workplan for Norway's participation, 8:48911 (R;NO)
Snyder Associates, Inc., Essex, CT (USA)
Design and construction of a mobile biomass gasifier close-coupled to an engine-generator set, 8:48772 (R;US)
Solar Energy Research Inst., Golden, CO (USA)
Acoustic ranging technique with application to assessment of low-frequency acoustic noise of wind turbines, 8:48944 (R;US)
Fuel gas production from animal and agricultural residues and biomass: proceedings of the December 1982 Anaerobic Digestion Program review meeting, 8:48779 (R;US)
Report on visit of US solar-energy specialist team to Israel, 9-14 September 1979, 8:48792 (R;US)
Technical and economic review of wood energy systems for military bases, 8:48791 (R;US)
Solarex Corp., Rockville, MD (USA)
Process research on polycrystalline-silicon material (PROPSM). Quarterly report No. 10, April 1, 1983 - June 30, 1983, 8:48834 (R;US)
Soletanche and Rodio, Inc., McLean, VA (USA)
Development of a slurry filling system for modified in situ oil shale mining. Open file report 28 Sep 79-30 Jun 82, 8:48622 (R;US)
South Dakota State Univ., Brookings (USA). Water Resources Inst.
Wind energy for low head irrigation. Report for Oct 79-Sep 82, 8:48946 (R;US)
Southern Illinois Univ., Carbondale (USA)
Petrographic and fluorescence spectral properties of liptinite and vitrinite coal macerals. Annual report Jan-Dec 82, 8:48535 (R;US)
Southern Illinois Univ., Carbondale (USA). Coal Extraction and Utilization Research Center
Mining research and development program. Quarterly report, March 25, 1983-June 25, 1983, 8:48552 (R;US)
Southern Illinois Univ., Edwardsville (USA)
Post-mining neutralization of acid surface mine lakes, 8:48548 (R;US)
Southern Universities Nuclear Inst., Faure (South Africa)
Southern Universities Nuclear Institute annual research report for the year ending December 1981, 8:50261 (R;ZA)
Southwest Research Inst., San Antonio, TX (USA). Engineering Analysis Services
Feasibility study for adding a demand failure data collection system to the Nuclear Plant Reliability Data System. Final report, 8:49134 (R;US)
SRI International, Menlo Park, CA (USA)
Coal-Resources Model: an impact-analysis tool. Final report, 8:48551 (R;US)
Exploratory study of coal-conversion chemistry. Quarterly report No. 8, February 19, 1983-May 18, 1983, 8:48511 (R;US)
SRI International, Menlo Park, CA (USA). Center for Resource and Environmental Systems Studies
Transportation energy alternatives: implementation strategies. Final report, 8:49448 (R;US)
Staatskanzlei des Saarlandes, Saarbruecken (Germany, F.R.). Abt. Presse und Information
Energy policy in the Saarland, 8:48590 (R;DE;In German)
Stanford Linear Accelerator Center, CA (USA)
Covariant theory with a confined quantum, 8:50269 (R;US)
Dimethylether: a low velocity, low diffusion drift chamber gas, 8:49764 (R;US)
Interactive graphics for data analysis, 8:50442 (R;US)
Introduction to high-energy physics and the Stanford Linear Accelerator Center (SLAC), 8:50174 (R;US)
Minimal unitary (covariant) scattering theory, 8:50301 (R;US)
Physics with polarized beams in $e+e^-$ colliders, 8:50173 (R;US)
Remote interrupt module (Engineering Materials), 8:49727 (E;US)
Serial input/output processor (SIOP) (Engineering Materials), 8:49726 (E;US)
SLAC 32 channel TAC module (Engineering Materials), 8:49737 (E;US)
SLAC LORA MUX tester module (Engineering Materials), 8:49738 (E;US)
SLAC Shamar 2 SHAM tester module (Engineering Materials), 8:49736 (E;US)
SLAC SPEAR drift tube - Kicker Magnet Straight Section 2S3 (Engineering Materials), 8:49730 (E;US)
SLAC SPEAR excitation chamber S-10S11 (Engineering Materials), 8:49731 (E;US)
SPEAR radiation mask section 8S9 (Engineering Materials), 8:49729 (E;US)
Stanford Linear Accelerator Center monthly report for July 1982, 8:49713 (R;US)
Stanford Linear Accelerator Center monthly report for April 1982, 8:49714 (R;US)
Status and future plans for the Mark II detector at SLAC, 8:49765 (R;US)
System interrupt module (Engineering Materials), 8:49725 (E;US)
Weldment - drift tube, electric quad to Q2 (Engineering Materials), 8:49728 (E;US)
Word of caution, 8:50193 (R;US)
Stanford Univ., CA (USA). Dept. of Geology
Active metasomatism in the Cerro Prieto geothermal system, Baja California, Mexico: a telescoped low pressure/temperature metamorphic facies series, 8:48922 (R;US)
Calc-silicate mineralization in active geothermal systems, 8:48923 (R;US)
Hydrothermal-flow regime and magmatic heat source of the Cerro Prieto geothermal system, Baja California, Mexico, 8:48921 (R;US)
Stanford Univ., CA (USA). Dept. of Materials Science and Engineering
Structural studies of amorphous Mo-Ge alloys through the semiconductor-metal transition, 8:49470 (R;US)
Stanford Univ., CA (USA). Stanford Geothermal Program
Geothermal-reservoir engineering research at Stanford University. Second annual report, October 1, 1981-September 30, 1982, 8:48934 (R;US)

Stanford Univ., CA (USA). Stanford Synchrotron Radiation Lab.
SSRL activity report for April 1, 1982-March 31, 1983. SSRL report 83/01, 8:49676 (R;US)
Statens Industriverk, Stockholm (Sweden)
Market and the production cost of alternative fuels. Two consutative studies, 8:49464 (R;SE;In Swedish)
Statens Kaernkraftinspektion, Stockholm (Sweden)
Application of radal gamma thermometer assemblies for coolant monitoring in Ringhals W-PWRs, 8:49000 (R;SE)
Statens Raad foer Byggnadsforskning, Stockholm (Sweden)
Radon in dwellings. A method for the calculation of radon daughters in dwellings, 8:49826 (R;SE;In Swedish)
Statens Stralskyddsinstitut, Stockholm (Sweden)
Release of activity - occupational exposures of the nuclear power industry. Second quarter 1982, 8:49767 (R;SE;In Swedish)
Reliability of the systems of personal dosimetry. An investigation of the systems of personal dosimetry in Sweden, 8:49766 (R;SE;In Swedish)
Statens Vattenfallsverk, Vaellingby (Sweden). Projekt KOL-HAELSA-MILJOE
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Qualifier
Title, (supplementary information), citation number, (R:US)

The notations in the final parentheses indicate the type of document, e.g., R for Report; the country of publication, e.g., US; and the language if other than English, e.g., In German. Tables of document types and country of publication codes appear after the indexes.

The title may be supplemented with additional words, or a phrase, if it appears additional information would be helpful. In cases for which the title contains little or no information related to the subject entry, it may be replaced entirely by the supplementary information. A qualifier is not always required, and in such cases the title will follow the unqualified subject descriptor.

The descriptors selected for use as subject terms are generally the names of specific materials, things, or processes. To the extent possible, a qualifier is selected to describe the properties of, or processses applied to, the subject term.

Index entries are selected to indicate the important ideas and concepts presented in a document, rather than words that may appear in the text. Within the available thesaurus terms, the most probable or logical place to look for typical information is selected. "See references" are included to guide users from synonymous terms or phrases to the descriptor selected as a subject heading for the concept. (e.g. Pipeline Quality Gas see HIGH BTU GAS). "See also references" are used to indicate where to find references to subject concepts that are narrower, broader, or related to a particular subject heading. To complete an exhaustive search of a given subject, all such headings should be reviewed. Copies of DOE/TIC-7000, the Subject Thesaurus, are available from the National Technical Information Service (NTIS), U. S. Department of Commerce, Springfield, VA 22161.

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Test Facilities
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Power Generation
Comparison of costs of electricity generation based on nuclear energy and pit coal. Study of the Energiewirtschaftliches Inst., Koeln Univ. - update, 8:49256 (R;DE;In German)
Statistical Data
Inventory of power plants in the United States. 1982 annual (Contains glossary), 8:49268 (R;US)
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Control of nitrogen oxides: assessment of needs and options. Volume 5. Emissons control technology for combustion sources. Technical support document. Final report, 8:49830 (R;US)
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Spectroscopy
Collisions and spectroscopy: progress of QDT, 8:50121 (RA;GB)

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Bibliographies
FEMA (Federal Emergency Management Agency) database requirements assessment and resource directory model. Final report 24 Aug 81-15 May 82, 8:50074 (R;US)

Organizational Models
On-site emergency planning, 8:49165 (R;DE)
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Energy Analysis Program annual report, FY 1982, 8:49426 (R;US)
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Congressional justification for 1983 estimates, US Department of Housing and Urban Development. Part 2: Solar Energy and Conservation Bank, Community Planning and Development, New Community Development Corporation, Policy Development and Research, Fair Housing and Equal Opportunity, 8:49286 (R;US)
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Report on operation utilization and technical development of research reactors and hot laboratory. April 1, 1980 to March 31, 1981, 8:49180 (R;JP;In Japanese)
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Report on operation utilization and technical development of research reactors and hot laboratory. April 1, 1980 to March 31, 1981, 8:49180 (R;JP;In Japanese)
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Report on operation utilization and technical development of research reactors and hot laboratory. April 1, 1980 to March 31, 1981, 8:49180 (R;JP;In Japanese)

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KENTUCKY
Coal Deposits
Petrographic characterization of Kentucky coals: relationship between sporinite spectral fluorescence and coal rank of selected western Kentucky coals. Final report, Part I, 8:48529 (R;US)
Radioactive Waste Disposal
A mechanism for transport of plutonium through soil at the Maxey Flats, Ky., shallow land burial site, 8:48735 (J;US)
KERNFORSCHUNGSZENTRUM KARLSRUHE
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Home-heating-oil price-monitoring report, June 1982-May 1983, 8:48601 (R;US)
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Pathological Changes
Assessment in rodents of the pathological and immunopathological consequence of multiple vaccinations and challenge with radiation-attenuated malaria parasites (blood forms and sporozoites). Final report for the period 1 May 1979 - 31 May 1982, 8:50011 (R;XA)
Scintiscanning
Comparative study of unilateral renal tubule function using ^{131}I-o-hippuran and sup(99m)Tc-dimercaptosuccinic acid with regard to renal depth and excretion relations, 8:49957 (R;DE;In German)
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KOPPERS-TOTZEK PROCESS
Pollution Control Technical Manual for Koppers-Totzek based indirect coal liquefaction. Final report Jun 82-Feb 83, 8:48547 (R;US)
KRYPTON
Molecule-Molecule Collisions
Kinetics of growth and decay of excited rare-gas atoms and molecules in the pulse radiolysis of pure rare gases and of mixtures of rare gases with molecular quenching agents, 8:50140 (R;US)
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Inventories
Airborne radionuclide waste-management reference document, 8:48661 (R;US)
Standards
1982 environmental-monitoring program report for the West Valley Demonstration Project site, 8:49859 (R;US)
Storage
Long-term storage of radioactive kryston in pressure vessels; safety, 8:48643 (R;US)
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1982 environmental-monitoring program report for the West Valley Demonstration Project site, 8:49859 (R;US)
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1982 environmental-monitoring program report for the West Valley Demonstration Project site, 8:49859 (R;US)
KRYPTON IONS
Collisions
Implications of heavy-ion-induced satellite x-ray emission. III. Chemical effects in high resolution sulfur K/sub α/ x-ray spectra, 8:50119 (R;US)

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Biosynthetic preparation of high specific activity $H^{35}S$-labelled methionine, 8:49603 (RA;IL)
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LAKES
Acidification
Post-mining neutralization of acid surface mine lakes, 8:48548 (R;US)
Limnology
Comparative study of the N metabolism of phytoplankton and periphyton communities in oligotrophic lakes. Part of a coordinated programme on isotopic-tracer-aided research and monitoring on agricultural residue - biological interactions in aquatic ecosystems. Final report for the period 1 July 1977 - 30 June 1982, 8:49880 (R;XA)
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Polarization of Λ0 produced by neutrons with energy of about 40 GeV on carbon nuclei, 8:50169 (R;SU;In Russian)
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LAMPF LINAC
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Progress at LAMPF: Clinton P. Anderson Meson Physics Facility. Progress report, January-December 1982, 8:50260 (R;US)

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Progress at LAMPF: Clinton P. Anderson Meson Physics Facility. Progress report, January-December 1982, 8:50260 (R;US)

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Case studies: developing land uses in surface-mine reclamation, 8:49867 (R;US)

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Advanced-laser development for isotope separation. Final report, 8:48629 (R;US)

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Electron-atom scattering modified by a resonant laser field, 8:50136 (RA;GB)
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LASER TARGETS
Energy Transfer
Use of induced spatial incoherence for uniform illumination on laser fusion targets. Memorandum report, 8:50389 (R;US)

LASER WELDING
Development of special devices for CO_2 laser welding and investigation of the welding parameters, 8:49621 (RA;IL)

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Advanced-laser development for isotope separation. Final report, 8:48629 (R;US)

LASL
Accelerator Facilities
Los Alamos National Laboratory 3-stage Van de Graaff accelerator facility, 8:49698 (RA;US)
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Isotope and Nuclear Chemistry Division annual report FY 1982, October 1981-September 1982, 8:49617 (R;US)
Nuclear Chemistry
Isotope and Nuclear Chemistry Division annual report FY 1982, October 1981-September 1982, 8:49617 (R;US)

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System safety: a reality at a national laboratory, 8:50085 (R;US)

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LECTURES
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Energy & Environment Division annual report. Energy-Efficient Buildings Program, FY 1982, 8:49425 (R;US)
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Occupant response to lighting controls affecting office work station environments (Extended abstract only), 8:49413 (RA;US)
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Frictional ignition suppression by the use of cutter-drum mounted sprays. Open file report Apr 79-Dec 81, 8:48559 (R;US)

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Hydrogen bonding in asphaltenes and coal liquids. Quarterly report, May 1-July 31, 1983, 8:48510 (R;US)
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Adiabatic analysis of low-energy electron molecule dynamics, 8:50131 (RA;GB)
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Comparative study of the N metabolism of phytoplankton and periphyton communities in oligotrophic lakes. Part of a coordinated programme on isotopic-tracer-aided research and monitoring on agricultural residue - biological interactions in aquatic ecosystems. Final report for the period 1 July 1977 - 30 June 1982, 8:49880 (R;XA)

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Formerly utilized MED/AEC sites Remedial Action Program. Radiological survey of the Albany Metallurgical Research Center, United States Bureau of Mines, Albany, Oregon, 8:49842 (R;US)
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Safety Standards
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Seismic Effects
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Site Selection
Bibliography of the Maryland Power Plant Siting Program, fourth edition, 8:48958 (R;US)
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Research Programs
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Southern Universities Nuclear Institute annual research report for the year ending December 1981, 8:50261 (R;ZA)

Statistical Models
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Isotope and Nuclear Chemistry Division annual report FY 1982, October 1981-September 1982, 8:49617 (R;US)

NUCLEAR TRADE
Trade or commerce involving special nuclear material or any other radioactive materials, instruments, equipment, plants, etc, of nuclear interest.

Bilateral Agreements
Decree No 82-430 of 19 May 1982 publishing the Co-operation Agreement between the Government of the French Republic and the Government of the Egyptien Arab Republic on the Peaceful Uses of Nuclear Energy (with two Annexes), signed in Paris on 27 March 1981, 8:48971 (R;FR;In French)
Decree No 82-701 of 29 July 1982 publishing the Co-operation Agreement between the Government of the French Republic and the Government of the Republic of Bangladesh on the Peaceful Uses of Nuclear Energy signed in Paris on 29 August 1980, 8:48972 (R;FR;In French)

Political Aspects
Market stresses and readjustment: politics and pragmatism in the international uranium market, 8:48656 (RA;US)

Technology Transfer
Decree No 82-430 of 19 May 1982 publishing the Co-operation Agreement between the Government of the French Republic and the Government of the Egyptien Arab Republic on the Peaceful Uses of Nuclear Energy (with two Annexes), signed in Paris on 27 March 1981, 8:48971 (R;FR;In French)
Decree No 82-701 of 29 July 1982 publishing the Co-operation Agreement between the Government of the French Republic and the Government of the Republic of Bangladesh on the Peaceful Uses of Nuclear Energy signed in Paris on 29 August 1980, 8:48972 (R;FR;In French)

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Mechanical engineering department technical abstracts, 8:49815 (R;US)

Public Opinion
Freeze: the literature of the nuclear weapons debate, 8:49254 (R;US)

Radiochemical Analysis
Isotope and Nuclear Chemistry Division annual report FY 1982, October 1981-September 1982, 8:49617 (R;US)

Testing
Isotope and Nuclear Chemistry Division annual report FY 1982, October 1981-September 1982, 8:49617 (R;US)

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Program Management
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Air Quality
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Fuel Supplies
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Oil spill combat: Damage assessment using multiattribute utility analysis, 8:48606 (R;NO)

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Pollution control technical manual: Lurgi oil shale retorting with open pit mining. Final report, 8:48621 (R;US)

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Pollution control technical manual: TOSCO 2 oil shale retorting with underground mining. Final report, 8:48620 (R;US)

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Organometallic geochemistry: isolation and identification of organoarsenic compounds from Green River formation oil shale, 8:48616 (RA;US)
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Development of a slurry filling system for modified in situ oil shale mining. Open file report 28 Sep 79-30 Jun 82, 8:48622 (R;US)
Pollution control technical manual: modified 'in situ' oil shale retorting combined with Lurgi surface retorting. Final report, 8:48619 (R;US)
Retorting
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Pollution control technical manual: modified 'in situ' oil shale retorting combined with Lurgi surface retorting. Final report, 8:48619 (R;US)
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Trajectories
Aerial photographic surveys analyzed to deduce oil spill movement during the decay and breakup of fast ice, Prudhoe Bay, Alaska. Final report, 8:48605 (R;US)
Weathering
Frequency and distribution of natural and pollutant organic sea slicks. Memorandum report, 8:49870 (R;US)

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Residual stress measurements in welded specimens of pressure vessel type A533B. Final report SKI project no B27/28, 8:49503 (R;SE)

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Pollution Control Technical Manual for Exxon Donor Solvent direct coal liquefaction. Final report Apr 82-Oct 82, 8:48546 (R;US)
Pollution Control Technical Manual for Koppers-Totzek based indirect coal liquefaction. Final report Jun 82-Feb 83, 8:48547 (R;US)
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Energy technology characterizations handbook: environmental pollution and control factors. Third edition, 8:49908 (R;US)

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Control of nitrogen oxides: assessment of needs and options. Volume 5. Emissons control technology for combustion sources. Technical support document. Final report, 8:49830 (R;US)

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	8:48613	Energy (Oxford) 7 NO. 7. 567-602 (Jul 1982).
AC01-79PE70042	Resource Planning Associates, Inc., Cambridge, MA (USA)	
	8:49455	DOE/PE/70042—1
AC01-80CS40402	Energetics, Inc., Columbia, MD (USA)	
	8:49451	DOE/CS/40402—T3
AC01-80PE70039	Sandia National Labs., Albuquerque, NM (USA)	
	8:49520	SAND—83-0641
AC01-82CE15095	National Center for Appropriate Technology, Butte, MT (USA)	
	8:49454	DOE/CE/15095—2
AC01-82EP15100	Aerospace Corp., Washington, DC (USA)	
	8:49908	DOE/EP—0093
AC01-82ER30044	Research and Management Technicians, Inc., Gaithersburg, MD (USA)	
	8:49332	DOE/ER/30044—T1
AC02-76CH00016	Brookhaven National Lab., Upton, NY (USA)	
	8:48744	BNL—33355
	8:48745	BNL—33417
	Rockwell International Corp., Canoga Park, CA (USA). Energy Systems Group	
	8:48932	BNL—33132
	Brookhaven National Lab., Upton, NY (USA)	
	8:48984	BNL-NUREG—33385
	8:49227	BNL—33229
	8:49524	BNL—33440
	8:49525	BNL—33451
	8:49559	BNL—33370
	8:49577	BNL—33293
	8:49632	NUREG/CR—3284
	8:49641	International Journal of Multiphase Flow 8 NO. 4. 443-447 (Aug 1982).
	8:49674	BNL—33368
	Washington Univ., Seattle (USA). Nuclear Physics Lab.	
	8:49691	DOE/ER/40048—24-L2(1982).
	Brookhaven National Lab., Upton, NY (USA)	
	8:49724	BNL—33416
	8:49735	BNL—33450
	8:49827	BNL—33441
	Northwestern Univ., Evanston, IL (USA). Dept. of Physics and Astronomy	
	8:50117	BNL—33379
	Brookhaven National Lab., Upton, NY (USA)	
	8:50160	BNL—33384
	8:50176	BNL—33415
	8:50177	BNL—33502
	8:50447	BNL-NCS—51665
AC02-76CH03000	Fermi National Accelerator Lab., Batavia, IL (USA)	
	8:49732	FERMILAB-Conf—82/55-THY
AC02-76CH03073	Princeton Univ., NJ (USA). Plasma Physics Lab.	
	8:50382	PPPL—2019
	8:50383	PPPL—2023
	8:50408	PPPL—2011
AC02-76ER01116	Ohio State Univ., Columbus (USA). Dept. of Chemistry	
	8:50140	DOE/ER/01116—36
AC02-76ER01545	Ohio State Univ., Columbus (USA). Dept. of Physics	
	8:50178	DOE/ER/01545—330
AC02-76ER02167	Michigan Univ., Ann Arbor (USA). Dept. of Physics	
	8:49675	DOE/ER/02167—T1
AC02-76ER03342	Massachusetts Inst. of Tech., Cambridge (USA)	
	8:50307	DOE/ER/03342—11
AC02-76ET52040	Illinois Univ., Urbana (USA). Fusion Studies Lab.	
	8:50373	DOE/ET/52040—T14
AC02-76ET53016	Columbia Univ., New York (USA)	
	8:50395	DOE/ET/53016—83
AC02-76ET53051	Wisconsin Univ., Madison (USA). Dept. of Physics	
	8:50374	DOE/ET/53051—56
AC02-76EV03571	Yale Univ., New Haven, CT (USA)	
	8:50005	DOE/EV/03571—T2
AC02-77CH00178	Solar Energy Research Inst., Golden, CO (USA)	
	8:48779	SERI/CP—231-1924
	8:48791	SERI/TR—256-1477
	8:48792	SERI/SP—411-582
	8:48944	SERI/TP—215-1954
AC02-78ET34212	Babcock and Wilcox Co., Lynchburg, VA (USA). Utility Power Generation Div.	
	8:48985	DOE/ET/34212—35
AC02-78ET51013	Massachusetts Inst. of Tech., Cambridge (USA). Plasma Fusion Center	
	8:50372	DOE/ET/51013—84
	8:50392	DOE/ET/51013—70
	8:50393	DOE/ET/51013—85
	8:50394	DOE/ET/51013—91
AC02-79ET10815	Univ. of Tennessee Space Inst., Tullahoma	
	8:49296	CONF-830634—(1983).
	8:49313	CONF-830634—(1983).
	8:49323	CONF-830634—(1983).
	8:49324	CONF-830634—(1983).
	8:49325	CONF-830634—(1983).
	Tennessee Univ., Tullahoma (USA). Space Inst.	
	8:49327	DOE/ET/10815—87
AC02-80CS23337	Purdue Univ., Lafayette, IN (USA). Ray W. Herrick Labs.	
	8:49418	DOE/CS/23337—T2
	8:49419	DOE/CS/23337—T3
	8:49420	DOE/CS/23337—T4
AC02-80ER10559	City Coll., New York (USA). Inst. of Applied Chemical Physics	
	8:50158	DOE/ER/10559—T1
AC02-80ER10721	Indiana Univ., Bloomington (USA). Dept. of Chemistry	
	8:48507	DOE/ER/10721—T2

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AC02-80ER10746	Arizona Univ., Tucson (USA). Dept. of Chemistry	
	8:49578	DOE/ER/10746—3
AC02-80EV10403	Illinois Univ., Urbana (USA)	
	8:49828	DOE/EV/10403—11
AC02-81ER10902	Nebraska Univ., Lincoln (USA). Dept. of Agricultural Biochemistry	
	8:49918	DOE/ER/10902—3
AC02-81ER10963	Notre Dame Univ., IN (USA). Dept. of Metallurgical Engineering and Materials Science	
	8:49469	DOE/ER/10963—1
AC02-81ER40033	Rockefeller Univ., New York (USA)	
	8:49740	DOE/ER/40033—46
	8:50162	DOE/ER/40033—47
	8:50163	DOE/ER/40033—48
AC02-81EV10566	Rutgers--the State Univ., Piscataway, NJ (USA). Waksman Inst. of Microbiology	
	8:49917	DOE/EV/10566—6
AC02-82CH10122	ESG, Inc., Atlanta, GA (USA)	
	8:48905	DOE/CH/10122—17
	8:49417	DOE/CH/10122—8
AC02-83ER40085	Tufts Univ., Medford, MA (USA). Dept. of Physics	
	8:50164	DOE/ER/40085—3
AC03-76CS32382	Manyam and Associates, Inc., Lansing, MI (USA)	
	8:48906	DOE/CS/32382—T1
	8:48907	DOE/CS/32382—T2
AC03-76SF00098		
	8:48540	LBL—15295(Jun 1983).
	8:48607	LBL—15295(Jun 1983).
	Lawrence Berkeley Lab., CA (USA)	
	8:48612	LBL—16018
	8:48614	LBL—15295(Jun 1983).
	8:48615	LBL—15295(Jun 1983).
	8:48616	LBL—15295(Jun 1983).
	8:48618	LBL—16079
	8:48774	LBL—15295
	8:48775	LBL—15295(Jun 1983).
	8:48788	LBL—15295(Jun 1983).
	8:48789	LBL—15295(Jun 1983).
	8:49223	LBL—15295(Jun 1983).
	8:49224	LBL—16511
	8:49265	LBL—16386
	8:49342	CONF-830229—(1983).
	8:49347	CONF-830229—(1983).
	8:49348	CONF-830229—(1983).
	8:49349	CONF-830229—(1983).
	8:49369	CONF-830229—(1983).
	8:49376	CONF-830229—(1983).
	8:49377	CONF-830229—(1983).
	8:49386	CONF-830229—(1983).
	8:49391	CONF-830229—(1983).
	8:49401	CONF-830229—(1983).
	8:49406	CONF-830229—(1983).
	8:49407	CONF-830229—(1983).
	8:49408	CONF-830229—(1983).
	8:49409	CONF-830229—(1983).
	8:49413	CONF-830229—(1983).
	8:49423	LBL—14517
	8:49424	LBL—14788-Rev.
	8:49425	LBL—15297
	8:49426	LBL—15299
	8:49427	LBL—15376
	8:49428	LBL—16126
	8:49429	LBL—16322
	8:49444	Energy (Stamford, Connecticut) 7 NO. 11. 909-926 (Nov 1982).
	8:49493	LBL—14175
	8:49494	LBL—14704
	8:49495	LBL—15864
	8:49496	LBL—16024
	8:49497	LBL—16233
	8:49498	LBL—16290
	8:49552	LBL—16216
	8:49553	LBL—16234
	8:49568	LBL—15828
	8:49584	LBL—16273
	8:49585	LBL—16441
	8:49595	LBL—15354
	8:49638	LBL—16297
	8:49668	LBL—16437
	8:49669	LBL—16502
	8:49719	LBL—15987
	8:49720	LBL—16148
	8:49768	IEEE (Institute of Electrical and Electronics Engineers) Transactions on Nuclear Science 3
	8:49770	IEEE (Institute of Electrical and Electronics Engineers) Transactions on Nuclear Science 3
	8:49781	LBL—15410
	8:49822	LBL—16155
	8:49823	LBL—16302
	8:49831	LBL—14574
	8:49832	LBL—14959
	8:49853	LBL—16214
	8:49916	LBL—16341
	8:50152	LBL—15855
	8:50153	LBL—16327
	8:50170	LBL—16116
	8:50171	LBL—16146
	8:50264	LBL—16469
	8:50273	LBL—16175
	Gesellschaft fuer Schwerionenforschung m.b.H., Darmstadt (Germany, F.R.)	
	8:50280	LBL—16110
	Lawrence Berkeley Lab., CA (USA)	
	8:50281	LBL—16372
	8:50293	LBL—15894
	8:50294	LBL—16249
	8:50299	LBL—15838
	8:50300	LBL—15877
	8:50376	LBL—10070
	8:50403	LBL—15066
	8:50404	LBL—16153
	8:50405	LBL—16222
AC03-76SF00515	Stanford Linear Accelerator Center, CA (USA)	
	8:49713	DOE/SF/00515—T18
	8:49714	DOE/SF/00515—T19
	8:49725	CAPE—2850(25 May 1981).
	8:49726	CAPE—2854(Aug 1978).
	8:49727	CAPE—2855(9 Mar 1981).
	8:49728	CAPE—2856(1 Mar 1972).
	8:49729	CAPE—2857(21 Mar 1983).
	8:49730	CAPE—2858(27 Mar 1974).
	8:49731	CAPE—2859(11 Nov 1981).
	8:49736	CAPE—2851(10 Apr 1980).
	8:49737	CAPE—2852(9 Aug 1978).
	8:49738	CAPE—2853(22 Dec 1981).
	8:49764	SLAC-PUB—3037
	8:49765	SLAC-PUB—3108
	8:49769	IEEE (Institute of Electrical and Electronics Engineers) Transactions on Nuclear Science 3
	8:49772	IEEE (Institute of Electrical and Electronics Engineers) Transactions on Nuclear Science 3
	8:50173	SLAC-PUB—3120
	8:50174	SLAC-TN—83-6
	8:50193	SLAC-PUB—3190
	8:50269	SLAC-PUB—3146
	8:50301	SLAC-PUB—3147
	8:50442	SLAC—253
AC03-76SF00700	Rockwell International Corp., Canoga Park, CA (USA). Energy Technology Engineering Center	
	8:48902	ETEC—82-19
AC03-81ER53113	Science Applications, Inc., La Jolla, CA (USA). Applied Plasma Physics and Technology Div.	
	8:50390	CONF-830404—75
	8:50409	SAI—02383-453LJ/APPAT-3
	Science Applications, Inc., La Jolla, CA (USA)	
	8:50410	SAI—02383-455LJ/APPAT-5

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	Science Applications, Inc., La Jolla, CA (USA). Applied Plasma Physics and Technology Div.	
	8:50411	SAI—02383-457LJ/APPAT-7
	8:50412	SAI—02383-458LJ/APPAT-8
AC03-82ER13000	**Stanford Univ., CA (USA). Dept. of Materials Science and Engineering**	
	8:49470	DOE/ER/13000—T1
	Stanford Univ., CA (USA). Stanford Synchrotron Radiation Lab.	
	8:49676	DOE/ER/13000—T2
AC04-76DP00053	**Monsanto Research Corp., Miamisburg, OH (USA). Mound**	
	8:49369	MLM—3085
AC04-76DP00789	**Sandia National Labs., Albuquerque, NM (USA)**	
	8:48521	SAND—83-0891C
	8:48522	SAND—83-1396
	8:48646	SAND—83-0867
	8:48647	SAND—83-1088C
	8:48671	NUREG/CR—3111-Vol.1
	New Mexico Univ., Albuquerque (USA)	
	8:48684	SAND—82-2212
	Sandia National Labs., Albuquerque, NM (USA)	
	8:48747	SAND—83-1320
	8:48757	SAND—83-0928
	8:48840	SAND—83-0604
	8:48933	SAND—83-0584
	Southwest Research Inst., San Antonio, TX (USA). Engineering Analysis Services	
	8:49134	DOE/DP/00789—T24
	Science Applications, Inc., Bethesda, MD (USA)	
	8:49192	NUREG/CR—3085/2-App.
	Sandia National Labs., Albuquerque, NM (USA)	
	8:49194	NUREG/CR—3258
	8:49196	NUREG/CR—3329-1
	Burns and Roe, Inc., Oradell, NJ (USA)	
	8:49198	NUREG/CR—3394-Vol.1
	8:49199	NUREG/CR—3394-Vol.2
	Sandia National Labs., Albuquerque, NM (USA)	
	8:49202	SAND—83-0447C
	8:49203	SAND—83-0724C
	8:49204	SAND—83-0791C
	8:49205	SAND—83-0831C
	8:49206	SAND—83-0841C
	8:49207	SAND—83-0894C
	8:49208	SAND—83-1734C
	8:49209	SAND—83-1735C
	8:49210	SAND—83-1737C
	8:49211	SAND—83-1738C
	8:49225	SAND—83-1655A
	8:49460	SAND—83-1216C
	8:49502	SAND—82-1479
	8:49507	IEEE (Institute of Electrical and Electronics Engineers) Transactions on Nuclear Science 3
	8:49515	SAND—83-0773C
	8:49521	SAND—83-1244
	8:49522	SAND—83-1592C
	8:49554	SAND—83-0294C
	8:49555	SAND—83-0974C
	8:49618	SAND—83-1474C
	8:49633	SAND—83-1123
	8:49634	SAND—83-1325
	8:49647	SAND—83-1769C
	8:49782	SAND—83-0615C
	8:49810	SAND—83-0654C
	8:50371	SAND—83-0936
	8:50413	SAND—83-0385C
	8:50428	SAND—83-1648C
	8:50440	SAND—82-2981
	8:50441	SAND—83-1538C
	8:50449	SAND—83-0401C
AC04-76DP03533		
	8:49642	

Contract No.	Abstract No.	Report No.
	Rockwell International Corp., Golden, CO (USA). Rocky Flats Plant	
	8:49878	RFP-Trans—409(Aug 1983).
AC05-76OR00033	**Oak Ridge Associated Universities, Inc., TN (USA)**	
	8:49829	DOE/NBB—0039
	Duke Univ., Durham, NC (USA). Dept. of History	
	8:49834	ORAU/IEA—82-10(M)
AC05-79ET15403	**EIC Laboratories, Inc. 111 Chapel Street, Newton, MA 02158**	
	8:49594	Electrochimica Acta 27 NO. 11. 1599-1608 (Nov 1982).
AC06-76FF02170	**Westinghouse Hanford Co., Richland, WA (USA)**	
	8:49022	HEDL-SA—2728-FP
	Hanford Engineering Development Lab., Richland, WA (USA)	
	8:49136	HEDL-SA—2876
AC06-76RL01830	**Pacific Northwest Lab., Richland, WA (USA)**	
	8:48520	PNL—4202-App.A-D
	RE/SPEC, Inc., Rapid City, SD (USA)	
	8:48673	ONWI—139
	Battelle Memorial Inst., Columbus, OH (USA). Office of Nuclear Waste Isolation	
	8:48674	ONWI—490
	Pacific Northwest Lab., Richland, WA (USA)	
	8:48679	PNL—4689
	8:48680	PNL—4722
	8:48681	PNL-SA—9787
	8:48682	PNL-SA—10913
	8:48683	PNL-SA—10976
	8:48778	PNL—4594
	8:48936	PNL-SA—9602
	8:48947	PNL—4403
	8:49043	NUREG/CR—0130-Add.2
	8:49073	PNL-SA—11153
	8:49195	NUREG/CR—3307-Vol.1
	8:49200	PNL-SA—11134
	8:49217	PNL-SA—11559
	8:49236	PNL-SA—11391
	8:49237	PNL-SA—11430
	8:49442	PNL-SA—10977
	8:49443	PNL-SA—11392
	8:49501	PNL-SA—11292
	8:49824	PNL—4797
	8:49825	PNL-SA—11551
	8:49837	PNL—4787
	8:49841	DOE/EP—0096
	8:50038	PNL-SA—11419
	8:50070	PNL-SA—9942
AC06-76RL01857	**UNC Nuclear Industries, Inc., Richland, WA (USA)**	
	8:49132	UNI-SA—106
AC06-80ET33067	**Mathematical Sciences Northwest, Inc., Bellevue, WA (USA)**	
	8:48629	DOE/ET/33067—T1
AC06-81ER40048	**Washington Univ., Seattle (USA). Nuclear Physics Lab.**	
	8:49657	DOE/ER/40048—24-L2
	8:50104	DOE/ER/40048—61
	Washington Univ., Seattle (USA)	
	8:50181	DOE/ER/40048—12-N3
	Washington Univ., Seattle (USA). Nuclear Physics Lab.	
	8:50254	DOE/ER/40048—60
	Washington Univ., Seattle (USA)	
	8:50289	DOE/ER/40048—63-L3
AC07-76ID01570	**EG and G Idaho, Inc., Idaho Falls (USA)**	
	8:48659	DOE/LLW—21T
	8:48660	EGG-WM—6324
	8:48663	IDO—10054(82)
	8:48664	IDO—10055(82)
	8:48931	EGG—2253
	8:49190	NUREG/CR—2148-Add.
	8:49193	NUREG/CR—3214
	8:49560	EGG-M—00883

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	8:49741	EGG-M—03683
	8:50397	EGG—2261
	8:50398	EGG—2266
AC07-78ID01745	Mountain States Energy, Inc., Butte, MT	
	8:49293	CONF-830634—(1983).
	8:49294	CONF-830634—(1983).
AC07-79ID01675	Exxon Nuclear Idaho Co., Inc., Idaho Falls (USA)	
	8:48661	ENICO—1133
AC07-81NE44139	West Valley Nuclear Services Co., Inc., West Valley, NY (USA)	
	8:49839	DOE/NE/44139—T1
AC08-81NV10162	Nevada Univ., Reno (USA). Center for Water Resources Research	
	8:49818	DOE/NV/10162—10
AC08-83NV10282	Hebrew Univ., Jerusalem (Israel). School of Applied Science and Technology	
	8:49739	CONF-830927—2
AC09-76SR00001	Du Pont de Nemours (E.I.) and Co., Aiken, SC (USA). Savannah River Lab.	
	8:48640	DP—1666
	Du Pont de Nemours (E.I.) and Co., Aiken, SC (USA). Savannah River Plant	
	8:48641	DP-MS—83-35
	8:48642	DPSP—83-1065
	Du Pont de Nemours (E.I.) and Co., Aiken, SC (USA). Savannah River Lab.	
	8:49579	DP—1655
AC09-78ET35900	Allied-General Nuclear Services, Barnwell, SC (USA)	
	8:48638	AGNS—35900-CONF-180
AC15-76CL50003	Westinghouse Electric Corp., Madison, PA (USA)	
	8:49020	DOE/CL/50003—T3
AC18-81FC10500	Rockwell International Corp., Canoga Park, CA (USA). Energy Systems Group	
	8:48515	ESG-DOE—13405
AC22-79ET14700	Utah Univ., Salt Lake City (USA). Dept. of Mining and Fuels Engineering	
	8:48508	DOE/ET/14700—15
AC22-80ET15611	Stanford Univ., CA	
	8:49302	CONF-830634—(1983).
	8:49314	CONF-830634—(1983).
	8:49315	CONF-830634—(1983).
	8:49316	CONF-830634—(1983).
AC22-80ET15614	Avco Everett Research Lab., Inc., MA	
	8:49298	CONF-830634—(1983).
	8:49303	CONF-830634—(1983).
	8:49305	CONF-830634—(1983).
	8:49307	CONF-830634—(1983).
	8:49310	CONF-830634—(1983).
	8:49311	CONF-830634—(1983).
AC22-80PC30022	Mobil Research and Development Corp., Paulsboro, NJ (USA)	
	8:48769	DOE/PC/30022—9
AC22-80PC30075	Massachusetts Inst. of Tech., Cambridge (USA)	
	8:48509	DOE/PC/30075—14
AC22-80PC30080	Gulf Research & Development Company, PO Drawer 2038, Pittsburgh, PA 15230	
	8:48527	Fuel 62 NO. 4. 401-406 (Apr 1983).
AC22-80PC30252	Duquesne Univ., Pittsburgh, PA (USA). Dept. of Chemistry	
	8:48510	DOE/PC/30252—T11
AC22-81PC40502	TRW Energy Development Group, Redondo Beach, CA	
	8:49297	CONF-830634—(1983).
	TRW Energy Development Group, Redondo Beach, CA (USA)	
	8:49329	DOE/PC/40502—T1
	8:49330	DOE/PC/40502—T2
AC22-81PC40785	SRI International, Menlo Park, CA (USA)	
	8:48511	DOE/PC/40785—8
AC22-82PC50041	Catalytic, Inc., Wilsonville, AL (USA)	
	8:48514	DOE/PC/50041—22
AI01-76ET20320	National Aeronautics and Space Administration, Cleveland, OH (USA). Lewis Research Center	
	8:48945	DOE/NASA/20320—47
AI01-76ET20356	Jet Propulsion Lab., Pasadena, CA (USA)	
	8:48818	DOE/JPL—1012-81
AI01-78CS54209	Jet Propulsion Lab., Pasadena, CA (USA)	
	8:49459	DOE/CS/54209—12
AI01-79ET25204	Aerospace Corp., Washington, DC (USA)	
	8:49221	CONF-821211—Suppl.
AI02-80RA50164	Naval Civil Engineering Lab., Port Hueneme, CA (USA)	
	8:48901	DOE/RA/50164—1
AI08-76DP00474	Geological Survey, Denver, CO (USA)	
	8:50094	USGS-OFR—83-399
AM03-76SF00113	University of Southern California, Institute for Physics and Imaging Science, 4676 Admiralty Way, Su	
	8:49771	IEEE (Institute of Electrical and Electronics Engineers) Transactions on Nuclear Science 3
AM03-76SF00701	Rockwell International Corp., Canoga Park, CA (USA). Energy Systems Group	
	8:49602	CONF-820973—3
AM03-76SF00767	Jet Propulsion Lab., Pasadena, CA (USA)	
	8:48801	CONF-830222—
AP22-82PC12993	Coal Tech Corp., Merion, PA (USA)	
	8:49328	DOE/PC/12993—T1
AS05-76ER03106	Florida Univ., Gainesville (USA). Dept. of Chemistry	
	8:49601	ORO—3106-82
AS05-76ER04043	Virginia Univ., Charlottesville (USA). Dept. of Physics	
	8:50161	DOE/ER/04043—T3
	8:50267	DOE/ER/04043—T2
AS05-76EV04568	Oak Ridge National Lab., TN (USA)	
	8:49993	DOE/EV/04568—38
AS05-76OR90300	Florida Univ., Gainesville (USA). Engineering and Industrial Experiment Station	
	8:49222	DOE/OR/90300—T1
AS05-78ER06030	Georgia Inst. of Tech., Atlanta (USA)	
	8:49590	DOE/ER/06030—4
AS05-78ET52025	Georgia Inst. of Tech., Atlanta (USA). School of Nuclear Engineering and Health Physics	
	8:50375	GTFR—42
AS05-79ER10361	Texas A and M Univ., College Station (USA). Center for Tectonophysics	
	8:48937	DOE/ER/10361—T2
AS05-79ER10448	North Carolina Univ., Chapel Hill (USA). Dept. of Physics and Astronomy	
	8:50179	DOE/ER/10448—1
AS05-80ER10720	Texas Univ., Austin (USA)	
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AS05-80ER10749	Arkansas Univ., Fayetteville (USA). Dept. of Physics	
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CONF-760736-	(Energy Research and Development Administration workshop on energy conservation in agricultural production, Washington, DC, USA, 15-16 Jul 1976) NTIS, PC A05/MF A01		STD -95f	8:49450
CONF-770931-	(7. international conference on atomic collisions in solids, Moscow, F.R. Germany, 19-23 Sep 1977)			
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CONF-8006205-	(Brazilian-German symposium on Nuclear Reactor Safety, Rio de Janeiro, Brazil, 16-20 Jun 1980)			
	See INIS-BR-05	DE83781073	MN -41	8:50075
CONF-800821-	(7. European electron microscopy congress and the international x-ray optics and microanalysis conference, Hague, Netherlands, 24-30 Aug 1980)			
	Leiden, Netherlands; Seventh European Congress on Electron Microscopy Foundation (1980).			8:50157
CONF-8009308-	(IAEA interregional training course on safety analysis, Karlsruhe, F.R. Germany, 3 Sep-15 Oct 1980)			
3	*See* INIS-mf-8100	DE83702785	MN -41	8:50030
12	*See* INIS-mf-7972	DE83780724	MN -78	8:49155
13	*See* INIS-mf-7973	DE83780725	MN -78	8:49095
14	*See* INIS-mf-7974	DE83780726	MN -80	8:49060
15	*See* INIS-mf-8019	DE83780740	MN -80	8:48970
16	*See* INIS-mf-7971	DE83780744	MN -78	8:48992
17	*See* INIS-mf-7976	DE83780745	MN -78	8:48993
18	*See* INIS-mf-7975	DE83780777	MN -78	8:49035
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20	*See* INIS-mf-8098	DE83702761	MN -2	8:49904
21	*See* INIS-mf-8099	DE83702762	MN -2	8:49844
22-Pt.1	*See* INIS-mf-8095	DE83702771	MN -41	8:49903
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23	*See* INIS-mf-8096	DE83702772	MN -41	8:49158
24	*See* INIS-mf-8103	DE83702774	MN -41	8:49910
25	*See* INIS-mf-8106	DE83702775	MN -41	8:49161
26	*See* INIS-mf-8112	DE83702776	MN -41	8:49162
27	*See* INIS-mf-8113	DE83702777	MN -41	8:49163
28	*See* INIS-mf-8116	DE83702778	MN -41	8:49165
29	*See* INIS-mf-8117	DE83702779	MN -41	8:49166
30	*See* INIS-mf-8118	DE83702780	MN -41	8:49167
31	*See* INIS-mf-8121	DE83702781	MN -41	8:49168
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35	*See* INIS-mf-8104	DE83702797	MN -80	8:49160
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38	*See* INIS-mf-8115	DE83702800	MN -80	8:49164
39	*See* INIS-mf-8119	DE83702801	MN -80	8:49067
40	*See* INIS-mf-8122	DE83702802	MN -80	8:49077
41	*See* INIS-mf-8123	DE83702803	MN -80	8:49068
42	*See* INIS-mf-8124	DE83702804	MN -80	8:49069
43	*See* INIS-mf-8125	DE83702805	MN -80	8:48979
44	*See* INIS-mf-8126	DE83702806	MN -80	8:49070
45	*See* INIS-mf-8127	DE83702807	MN -80	8:49169
46	*See* INIS-mf-8120	DE83702810	MN -78	8:48995
47	*See* INIS-mf-8101	DE83702816	MN -70	8:48665
CONF-8010318-	(31. Brazilian congress of geology, Camboriu, Santa Catarine, Brazil, 19-25 Oct 1980)			
16	*See* INIS-BR-04	DE83702759	MN -51	8:50097
CONF-8010323-	(IAEA interregional training course on quality assurance, Karlsruhe, F.R. Germany, 27 Oct-10 Dec 1980)			
25	*See* INIS-mf-7986	DE83780707	MN -38	8:49061
26	*See* INIS-mf-7988	DE83780708	MN -80	8:49076
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31	*See* INIS-mf-7931	DE83780733	MN -80	8:48959
32	*See* INIS-mf-8005	DE83780735	MN -80	8:48965
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35	*See* INIS-mf-8013	DE83780738	MN -80	8:48968
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37	*See* INIS-mf-7923	DE83780746	MN -80	8:49053
38	*See* INIS-mf-7928	DE83780775	MN -80	8:49033
39	*See* INIS-mf-7930	DE83780776	MN -80	8:49034
40	*See* INIS-mf-8016	DE83780779	MN -80	8:49037
41	*See* INIS-mf-7999	DE83780799	MN -80	8:48964
CONF-8010325-	(Seminar on temperature measurements in hostile environments, Warrington, UK, 1-2 Oct 1980)			
1	*See* INIS-mf-7894	DE83780750	MN -38	8:49792
2	*See* INIS-mf-7895	DE83780751	MN -38	8:49793
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10	*See* INIS-mf-7903	DE83780759	MN -80	8:49801
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12	*See* INIS-mf-7905	DE83780761	MN -79	8:49023
13	*See* INIS-mf-7906	DE83780762	MN -38	8:49057

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15	*See* INIS-mf-7908	DE83780764	MN -38	8:49591
16	*See* INIS-mf-7909	DE83780765	MN -38	8:49152
17	*See* INIS-mf-7910	DE83780766	MN -80	8:49012
18	*See* INIS-mf-7911	DE83780767	MN -79	8:49075
19	*See* INIS-mf-7912	DE83780768	MN -38	8:49013
CONF-8010327-	(Research co-ordination meeting on the use of isotope techniques for detection of moderate mineral imbalances in farm animals, Nicosia, Cyprus, 6-10 Oct 1980)			
	See IAEA-TECDOC-267	DE83702409	MN -48	8:49999
CONF-810106-	(19. Aerospace Sciences meeting, St Louis, MO, USA, 12-15 Jan 1981)			
10	NTIS, PC A02/MF A01; 1	DE83008617	MN -93	8:49288
CONF-8103168-	(Research co-ordination meeting on semi-dwarf cereal mutants and their use in cross-breeding, Vienna, Austria, 2-6 Mar 1981)			
	See IAEA-TECDOC-268	DE83702408	MN -48	8:50018
CONF-8104162-	(14. informal meeting on reactor noise, St. Englmar, F.R. Germany, 28-30 Apr 1981)			
Abstr.	*See* INIS-mf-8131	DE83781074	MN -80	8:49173
CONF-8104213-	(Computer fair conference and exposition, San Francisco, CA, USA, 3-5 Apr 1981)			
1	NTIS, PC A02/MF A01	DE83015515	MN -97b	8:48952
CONF-810748-	(Commercial photovoltaics measurements workshop, Vail, CO, USA, 27-29 Jul 1981)			
	Sol. Cells, 7: No. 1/2, 23-46(Nov 1982)			8:48890
	Sol. Cells, 7: No. 1/2, 135-146(Nov 1982)			8:48891
	Sol. Cells, 7: No. 1/2, 147-157(Nov 1982)			8:48892
	Sol. Cells, 7: No. 1/2, 165-174(Nov 1982)			8:48893
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CONF-8108156-	(Symposium on DNA-repair and chromatin, Saalfelden, Austria, 30 Aug-2 Sep 1981)			
	See INIS-mf-7892	DE83780945	MN -48	8:49914
CONF-8108161-	(70. IAU colloquium on the nature of symbiotic stars, Provence, France, 26-28 Aug 1981)			
	Dordrecht, Netherlands; D. Reidel (1982).			8:50110
CONF-8109220-	(IAEA interregional training course on nuclear power plant operational safety, Karlsruhe, F.R. Germany, 7 Sep-23 Oct 1981)			
1	*See* INIS-mf-8155	DE83702784	MN -41	8:49175
CONF-811070-	(IAEA advisory group meeting on nuclear data for radiation damage and safety, Vienna, Austria, 12-16 Oct 1981)			
8-Trans.	*See* INDC(CCP)-178/L	DE83703426	MN -34C	8:50292
CONF-8110288-	(OECD workshop on PAH, Pairs, France, 19-21 Oct 1981)			
1	*See* PNL-SA-9942	DE83014638	MN -48	8:50070
CONF-8111150-	(2. national congress on library and information science, Lima, Peru, 9-14 Nov 1981)			
1	*See* INIS-mf-7981	DE83780798	MN -2	8:48963
CONF-811279-	(2. applied physics conference of the Australian Institute of Physics, Melbourne, Australia, 1 Dec 1981)			
	Sydney, Australia; A.I.P. (1981).			8:50101
CONF-811285-	(EPRI fuel supply seminar, Memphis, TN, USA, 8-10 Dec 1981)			
Exc.	*See* EPRI-EA-3015	DE83902648	MN -90	8:48956
CONF-820112-	(Semi-annual meeting of the American Society of Heating, Refrigerating, and Air Conditioning Engineers, Houston, TX, USA, 24-28 Jan 1982)			
12	*See* PNL-SA-9602	DE83015430	MN -66g	8:48936
CONF-820135-	(International colloquium on baryon nonconservation, Bombay, India, 11-14 Jan 1982)			
3	*See* DOE/ER/70004-323	DE83015432	MN -34D	8:50226
CONF-820149-	(20. international meeting on nuclear physics, Bormio, Italy, 25-29 Jan 1982)			
8	*See* CEA-CONF-6564	DE83703422	MN -34C	8:50275
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1	*See* DOE/ER/40008-35	DE83015590	MN -34D	8:50180
CONF-820284-	(Workshop on forecasting electricity demand by state agencies, Washington, DC, USA, 23 Feb 1982)			
	See NUREG/CP-0042	DE83015000	MN -98F	8:49273
CONF-820382-	(Conference on recent developments in electron-atom and electron-molecule collision processes, Warrington, UK, 26-27 Mar 1982)			
	See DL/SCI/R-18	DE83781072	MN -34A	8:50139
CONF-820428-	(Conference on lasers in nuclear physics, Oak Ridge, TN, USA, 21-23 Apr 1982)			
	Nucl. Sci. Res. Conf. Ser., 3: 395-401(1982)			8:49722
	Nucl. Sci. Res. Conf. Ser., 3: 163-170(1982)			8:50155
	Nucl. Sci. Res. Conf. Ser., 3: 1-44(1982)			8:50265
	Nucl. Sci. Res. Conf. Ser., 3: 45-68(1982)			8:50266
	Nucl. Sci. Res. Conf. Ser., 3: 101-105(1982)			8:50274
CONF-820485-	(1. international conference on fixed-film biological processes, Kings Island, OH, USA, 20-23 Apr 1982)			
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CONF-820546-	(9. international cryogenic engineering conference, Kobe, Japan, 10-14 May 1982)			
16	*See* LBL-14175	DE83015715	MN -25	8:49493
CONF-8205178-	(Conference on pressurised water reactor in the United Kingdom, London, UK, 11 May 1982) London, England; Mechanical Engineering Publications Ltd. (1982).			8:49011
CONF-820627-	(75. annual meeting of the Air Pollution Control Association, New Orleans, LA, USA, 20-25 Jun 1982)			
18	*See* LBL-14574	DE83015945	MN -11	8:49831
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1	NTIS, PC A04/MF A01; 1	DE83015511	MN -83	8:49044
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1	*See* FERMILAB-Conf-82/55-THY	DE83015649	MN -28	8:49732
CONF-820705-	(2. joint ASME/ANS nuclear engineering conference, Portland, OR, USA, 25-28 Jul 1982)			
15	*See* DOE/SF/75008-T7	DE83016075	MN -70A	8:49125
CONF-820718-	(21. international conference on high energy physics, Paris, France, 29 Jul-8 Aug 1982)			
34	*See* JINR-E-2-82-413	DE83702243	MN -34D	8:50242
35	*See* JINR-D-1-82-116	DE83702292	MN -34D	8:50167
38	*See* CEA-CONF-6489	DE83702451	MN -34D	8:50225
45	*See* RL-82-090	DE83703414	MN -34D	8:50172
CONF-820793-	(7. North American Forest Biology workshop, Lexington, KY, USA, 25-28 Jul 1982)			
1	NTIS, PC A02/MF A01	DE83015532	MN -48	8:48542
CONF-820794-	(Conference on climate and energy: carbon dioxide, Erice, Italy, 16-26 Jul 1982)			
1	NTIS, PC A03/MF A01	DE83015530	MN -4	8:49871
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	See CEA-CONF-6491	DE83702416	MN -48	8:49930
7	*See* CEA-CONF-6492	DE83702434	MN -37	8:49931
CONF-820849-	(Summer study in energy efficient buildings, Santa Cruz, CA, USA, 22-28 Aug 1982)			
8-Rev.	*See* LBL-14788-Rev.	DE83016108	MN -95d	8:49424
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4	*See* IC-82/184	DE83702466	MN -34D	8:50341
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2	*See* CEA-CONF-6568	DE83703398	MN -34B	8:50102
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3	*See* BNL-33368	DE83015395	MN -28	8:49674
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3	NTIS, PC A02/MF A01; 1	DE83016076	MN -70	8:49602
CONF-820979-	(International conference on nucleus-nucleus collisions, East Lansing, MI, USA, 27 Sep-1 Oct 1982)			
9	*See* CEA-CONF-6597	DE83703423	MN -34C	8:50271
CONF-8209159-	(9. international symposium '82 of Baker Oil Tools G.m.b.H., Celle, F.R. Germany, 3 Sep 1982)			
1	NTIS (US Sales Only), PC A06/MF A01; 1	DE83770326	MN -92a	8:49620
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8	*See* INIS-mf-7932	DE83780710	MN -80	8:48977
9	*See* INIS-mf-7933	DE83780711	MN -80	8:49153
10	*See* INIS-mf-7934	DE83780712	MN -80	8:49083
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19	*See* INIS-mf-7951	DE83780721	MN -80	8:49092
20	*See* INIS-mf-7958	DE83780722	MN -80	8:49093
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30	*See* INIS-mf-7957	DE83780749	MN -80	8:49059
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1	*See* CEA-CONF-6574	DE83703399	MN -34B	8:50103
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	Trans. Am. Nucl. Soc., 43: 130-131(1982)			8:48731
	Trans. Am. Nucl. Soc., 43: 131-132(1982)			8:48732
	Trans. Am. Nucl. Soc., 43: 132(1982)			8:48733
	Trans. Am. Nucl. Soc., 43: 132-133(1982)			8:48734
	Trans. Am. Nucl. Soc., 43: 63-64(1982)			8:48735
	Trans. Am. Nucl. Soc., 43: 64-66(1982)			8:48736
	Trans. Am. Nucl. Soc., 43: 73(1982)			8:48737
	Trans. Am. Nucl. Soc., 43: 102-103(1982)			8:48738
	Trans. Am. Nucl. Soc., 43: 68(1982)			8:48741

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	Trans. Am. Nucl. Soc., 43: 68-69(1982)			8:48742
	Trans. Am. Nucl. Soc., 43: 76-77(1982)			8:48743
	Trans. Am. Nucl. Soc., 43: 125-126(1982)			8:48748
	Trans. Am. Nucl. Soc., 43: 177(1982)			8:48749
	Trans. Am. Nucl. Soc., 43: 179-180(1982)			8:48750
	Trans. Am. Nucl. Soc., 43: 89(1982)			8:48758
	Trans. Am. Nucl. Soc., 43: 89-90(1982)			8:48759
	Trans. Am. Nucl. Soc., 43: 91-93(1982)			8:48760
	Trans. Am. Nucl. Soc., 43: 154-155(1982)			8:48983
	Trans. Am. Nucl. Soc., 43: 83-84(1982)			8:49009
	Trans. Am. Nucl. Soc., 43: 52-53(1982)			8:49010
	Trans. Am. Nucl. Soc., 43: 135-136(1982)			8:49048
	Trans. Am. Nucl. Soc., 43: 97-98(1982)			8:49121
	Trans. Am. Nucl. Soc., 43: 108(1982)			8:49122
	Trans. Am. Nucl. Soc., 43: 133(1982)			8:49123
	Trans. Am. Nucl. Soc., 43: 141-142(1982)			8:49124
	Trans. Am. Nucl. Soc., 43: 81-82(1982)			8:49848
	Trans. Am. Nucl. Soc., 43: 78(1982)			8:49849
	Trans. Am. Nucl. Soc., 43: 79-80(1982)			8:49850
	Trans. Am. Nucl. Soc., 43: 80-81(1982)			8:49851
	Trans. Am. Nucl. Soc., 43: 637-638(1982)			8:49852
	Trans. Am. Nucl. Soc., 43: 170-171(1982)			8:50388
	Trans. Am. Nucl. Soc., 43: 183-185(1982)			8:50420
	Trans. Am. Nucl. Soc., 43: 176-177(1982)			8:50421
	Trans. Am. Nucl. Soc., 43: 177-178(1982)			8:50422
	Trans. Am. Nucl. Soc., 43: 178(1982)			8:50423
	Trans. Am. Nucl. Soc., 43: 171-172(1982)			8:50424
	Trans. Am. Nucl. Soc., 43: 172-173(1982)			8:50425
	Trans. Am. Nucl. Soc., 43: 174-175(1982)			8:50426
	Trans. Am. Nucl. Soc., 43: 169-170(1982)			8:50427
CONF-821107-	(6. international symposium on the scientific basis for radioactive waste management (Materials Research Society), Boston, MA, USA, 1-4 Nov 1982)			
56	*See* IS-M-423	DE83015211	MN -34	8:49550
57	*See* IS-M-422	DE83016515	MN -34	8:49549
CONF-821211-	(5. DOE battery and electrochemical contractors' conference, Crystal City, VA, USA, 7-9 Dec 1982)			
Suppl.	NTIS, PC A14/MF A01	DE83011254	MN -94	8:49221
CONF-821217-	(ASHRAE/DOE conference on thermal performance of building envelopes, Las Vegas, NV, USA, 5-9 Dec 1982)			
7	*See* LBL-14517	DE83016606	MN -95d	8:49423
CONF-821249-	(SERI anaerobic digestion program review meeting on fuel gas production from animal and agricultural residues and biomass, Golden, CO, USA, 6 Dec 1982)			
	See SERI/CP-231-1924	DE83011965	STD -61a	8:48779
CONF-821251-	(Symposium on solvent extraction, Hamamatsu, Japan, 10 Dec 1982)			
1	*See* IS-M-421	DE83015892	MN -4	8:49563
CONF-830106-	(Reliability and maintainability symposium, Orlando, FL, USA, 25 Jan 1983)			
2	*See* UCRL-86231	DE83015843	MN -11	8:49214
CONF-830140-	(18. Rencontre de Moriond conference, La Plagne, France, 23-29 Jan 1983)			
4	*See* DOE/ER/40033-47	DE83016553	MN -34D	8:50162
CONF-830222-	(DOE photovoltaics program annual review meeting, Arlington, VA, USA, 15-16 Feb 1983)			
	NTIS, PC A17/MF A01; 1	DE83010325	STD -63	8:48801
CONF-830223-	(Wire chamber conference, Vienna, Austria, 15-18 Feb 1983)			
7	*See* SLAC-PUB-3037	DE83016679	MN -28	8:49764
CONF-830229-	(International daylighting conference, Phoenix, AZ, USA, 16-18 Feb 1983)			
	NTIS, PC A18/MF A01; 1	DE83013799	MN -95d	8:49338
CONF-830231-	(Europhysics study conference on electroweak effects at high energies, Erice, Italy, 1-10 Feb 1983)			
4	*See* SLAC-PUB-3120	DE83016441	MN -34D	8:50173
5	*See* SLAC-PUB-3108	DE83016590	MN -28	8:49765
CONF-830235-	(7. international conference on infrared and millimeter waves, Marseilles, France, 14-18 Feb 1983)			
2	*See* LBL-15410	DE83015993	MN -25	8:49781
CONF-830301-	(ASME-JSME thermal engineering joint conference, Honolulu, HI, USA, 20-24 Mar 1983)			
18	NTIS MF A01; 2	DE83016363	MN -80	8:49018
CONF-830340-	(International conference on heavy-ion physics and nuclear physics, Catania, Italy, 21-26 Mar 1983)			
3	*See* LBL-16372	DE83016622	MN -34C	8:50281
CONF-830377-	(18. Rencontre de Moriond conference, LaPlagne, France, 19-25 Mar 1983)			
2	*See* LBL-16146	DE83016106	MN -34D	8:50171
CONF-830382-	(Conference on special functions in group theory, Oberwolfach, F.R. Germany, 13-19 Mar 1983)			
1	*See* LA-UR-83-2162	DE83015642	MN -32	8:50245
CONF-830404-	(5. symposium on the training of nuclear facility personnel, Gatlinburg, TN, USA, 25-28 Apr 1983)			
75	NTIS, PC A02/MF A01; 1	DE83016128	STD -20g	8:50390

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CONF-830406-	(5. topical meeting on technology of fusion energy, Knoxville, TN, USA, 26-28 Apr 1983)			
91	*See* SAI-02383-457LJ/APPAT-7	DE83016016	STD -20g	8:50411
92	*See* SAI-02383-458LJ/APPAT-8	DE83016125	STD -20g	8:50412
93	*See* SAI-02383-453LJ/APPAT-3	DE83016124	STD -20g	8:50409
94	*See* LBL-15066	DE83015691	MN -20a	8:50403
96	*See* SAI-02383-455LJ/APPAT-5	DE83016126	STD -20g	8:50410
97	*See* PPPL-2011	DE83016332	STD -20d	8:50408
CONF-830416-	(American Nuclear Society workshop on power plant security, Savannah, GA, USA, 24-27 Apr 1983)			
3	*See* BNL-33355	DE83015850	MN -15	8:48744
CONF-830432-	(Wind/solar energy conference, Kansas City, MO, USA, 25-26 Apr 1983)			
3	*See* SERI/TP-215-1954	DE83009406	STD -60	8:48944
5	*See* DOE/NASA/20320-47	DE83016423	STD -60	8:48945
CONF-830434-	(16. oil shale symposium, Golden, CO, USA, 13-15 Apr 1983)			
9	*See* LBL-16079	DE83015997	MN -91	8:48618
CONF-830451-	(American Ceramic Society annual meeting, Chicago, IL, USA, 25-28 Apr 1983)			
21	*See* PNL-SA-10976	DE83016083	MN -70	8:48683
22	*See* PNL-SA-10913	DE83016786	MN -70	8:48682
CONF-830455-	(Yamada conference on muon spin rotation and associated problems, Shimoda, Japan, 18-27 Apr 1983)			
8	*See* BNL-33379	DE83015392	MN -34D	8:50117
CONF-830477-	(10. photovoltaic cencentrator project integration meeting, Albuquerque, NM, USA, 6-7 Apr 1983)			
	See SAND-83-0604	DE83012338	MN -63c	8:48840
CONF-8304104-	(Nordic winter school, Hemsedal, Norway, 1 Apr 1983)			
2	*See* LBL-15877	DE83015951	MN -34C	8:50300
3	*See* LBL-15838	DE83016605	MN -34C	8:50299
CONF-8304112-	(4. workshop on grand unification, Philadelphia, PA, USA, 21-23 Apr 1983)			
2	*See* BNL-33415	DE83016438	MN -34D	8:50176
CONF-830528-	(7. international symposium on packaging and transportation of radioactive materials, New Orleans, LA, USA, 15-20 May 1983)			
54	*See* SAND-83-1088C	DE83016760	MN -71	8:48647
CONF-830539-	(International meeting for radionuclide metrology - alpha particle spectrometry and low level measurement, Harwell, UK, 10-13 May 1983)			
3	*See* LBL-15894	DE83015996	MN -34C	8:50293
CONF-830567-	(5. symposium on biotechnology for fuels and chemicals, Gatlinburg, TN, USA, 10-13 May 1983)			
5	*See* DOE/EV/04568-38	DE83015027	MN -48	8:49993
CONF-830573-	(2. international conference on radiation effects in insulators, Albuquerque, NM, USA, 30 May-3 Jun 1983)			
6	*See* BNL-33450	DE83016723	MN -25	8:49735
CONF-830575-	(Spring meeting of the Japan Society of Corrosion Engineers, Tokyo, Japan, 18-20 May 1983)			
5	*See* BNL-33451	DE83016732	MN -70	8:49525
CONF-830576-	(Real-time computer applications in nuclear and particle physics conference, Berkeley, CA, USA, 16-20 May 1983)			
14	*See* LBL-16148	DE83016139	MN -34C	8:49720
CONF-830585-	(International committee for radionuclide seminar on applied radionuclide metrology, Gell, Belgium, 16-17 May 1983)			
2	*See* EGG-M-03683	DE83015900	MN -37	8:49741
CONF-8305100-	(4. Electrochemical Society international symposium on molten salts, San Francisco, CA, USA, 8-13 May 1983)			
3	NTIS, PC A03/MF A01	DE83014045	MN -90a	8:49589
5	NTIS, PC A02/MF A01	DE83014299	MN -4	8:49593
7	NTIS, PC A03/MF A01; 1	DE83014048	MN -4	8:49526
CONF-8305106-	(3. annual national symposium on recent advances in pollutant monitoring of ambient air and stationary sources, Raleigh, NC, USA, 4 May 1983)			
2	*See* LBL-16302	DE83016190	MN -11	8:49823
CONF-8305112-	(3. annual contractors' meeting on contaminate control in hot coal derived gas streams, Washington, PA, USA, 23-26 May 1983)			
1	NTIS, PC A02/MF A01	DE83015367	MN -90e	8:49654
CONF-8305113-	(American Society for Quality Control congress, Denver, CO, USA, 21-23 May 1983)			
1	*See* SAND-83-0401C	DE83016158	MN -13	8:50449
CONF-8305114-	(Riso international conference on the use of simulation models in energy planning, Riso, Denmark, 9-11 May 1983)			
1	*See* BNL-33229	DE83014235	MN -98	8:49227
CONF-8305115-	(6. world congress on air quality, Paris, France, 16-20 May 1983)			
1	*See* DOE/EV/10403-11	DE83014592	MN -11	8:49828
CONF-8305120-	(Metallurgical Society symposium on fatigue at low temperatures, Louisville, KY, USA, 10 May 1983)			
1	*See* LBL-16024	DE83016619	MN -25	8:49496
CONF-8305121-	(31. annual conference on mass spectrometry and allied topics, Boston, MA, USA, 8-13 May 1983)			
1	*See* IS-M-419	DE83016345	MN -4	8:49562

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CONF-830607-	(American Society of Mechanical Engineers pressure vessel and piping conference, Portland, OR, USA, 19-24 Jun 1983)			
24	*See* PNL-SA-11134	DE83013827	MN -78	8:49200
CONF-830621-	(IEEE power electronics specialists conference, Albuquerque, NM, USA, 6-9 Jun 1983)			
40	*See* SAND-83-0385C	DE83015343	MN -28	8:50413
CONF-830633-	(3. symposium on separation science and technology for energy applications, Gatlinburg, TN, USA, 27 Jun-1 Jul 1983)			
5	*See* AGNS-35900-CONF-180	DE83016381	MN -83	8:48638
6	*See* IS-M-425	DE83016516	MN -4	8:49564
CONF-830634-	(21. symposium on engineering aspects of magnetohydrodynamics, Argonne, IL, USA, 27-29 Jun 1983)			
	NTIS, PC A21/MF A01; 1	DE83014481	MN -90g	8:49289
CONF-830640-	(ASHRAE conference, Washington, DC, USA, 26-30 Jun 1983)			
7	*See* LBL-16155	DE83016112	MN -11	8:49822
8	*See* LBL-15376	DE83015936	MN -95d	8:49427
CONF-830649-	(2. international corbicula symposium, Hot Springs, AR, USA, 21-24 Jun 1983)			
2	*See* PNL-SA-11153	DE83016086	MN -11	8:49073
CONF-830665-	(Health Physics Society summmer school on internal radiation dosimetry, Catonsville, MD, USA, 12-17 Jun 1983)			
3	*See* PNL-SA-11419	DE83013830	MN -48	8:50038
CONF-830674-	(6. international Balaton topical conference on high energy nuclear physics, Balatonfured, Hungary, 6-11 Jun 1983)			
3	*See* LBL-16110	DE83016002	MN -34C	8:50280
CONF-830675-	(6. high energy heavy ion study and 2. workshop on anomalons, Berkeley, CA, USA, 28 Jun-1 Jul 1983)			
4	*See* LBL-16175	DE83015955	MN -34C	8:50273
5	*See* LBL-16469	DE83016315	MN -34C	8:50264
CONF-830680-	(International symposium on the structure and properties of crystal defects, Liblice, Czechoslovakia, 13-17 Jun 1983)			
2	NTIS, PC A02/MF A01	DE83014623	MN -25	8:49468
CONF-830689-	(14. international symposium on multiparticle dynamics, Lake Tahoe, NV, USA, 1 Jun 1983)			
3	*See* SLAC-PUB-3190	DE83016678	MN -34D	8:50193
CONF-830695-	(Health Physics Society annual meeting, Baltimore, MD, USA, 19-23 Jun 1983)			
7	*See* EGG-M-00883	DE83014959	MN -37	8:49560
CONF-830696-	(ORSA-TIMS conference, Washington, DC, USA, 7-8 Jun 1983)			
2	*See* PNL-SA-11391	DE83016208	MN -98F	8:49236
3	*See* PNL-SA-11392	DE83016245	MN -95d	8:49443
CONF-8306107-	(International Society for Ecological Modeling (ISEM) conference on modelling the fate and effect of toxic substances in the environment, Copenhagen, Denmark, 6-10 Jun 1983)			
1	NTIS, PC A02/MF A01; 1	DE83015519	MN -90i	8:49873
CONF-8306108-	(7. actinide separations workshop, Oak Ridge, TN, USA, 23-24 Jun 1983)			
1	*See* DP-MS-83-35	DE83015413	MN -10	8:48641
CONF-8306110-	(2. Pisa meeting on advanced detectors, Castiglione della Pescaia, Italy, 2-8 Jun 1983)			
1	*See* DOE/ER/40033-46	DE83016556	MN -34D	8:49740
CONF-830702-	(21. ASME/AIChE national heat transfer conference, Seattle, WA, USA, 24-28 Jul 1983)			
22	*See* LBL-16297	DE83015524	MN -38	8:49638
CONF-830709-	(24. annual meeting of the Institute of Nuclear Materials Management, Vail, CO, USA, 10-13 Jul 1983)			
20	*See* BNL-33417	DE83015393	MN -15	8:48745
26	*See* LA-UR-83-1931	DE83015254	MN -15	8:48670
CONF-830714-	(20. IEEE annual conference on nuclear and space radiation effects, Gatlinburg, TN, USA, 18-21 Jul 1983)			
13	*See* SAND-83-0615C	DE83014604	MN -37	8:49782
CONF-830718-	(International Europhysics conference on high energy physics, Brighton, UK, 20-27 Jul 1983)			
2	*See* BNL-33384	DE83015794	MN -34D	8:50160
3	*See* DOE/ER/40033-48	DE83016555	MN -34D	8:50163
CONF-830719-	(American Physical Society meeting on shock waves in condensed media, Santa Fe, NM, USA, 18-21 Jul 1983)			
21	*See* LA-UR-83-2138	DE83015915	MN -45	8:49492
23	*See* UCRL-88800	DE83015884	MN -34	8:49592
36	*See* SAND-83-0974C	DE83016233	MN -34	8:49555
37	*See* LA-UR-83-2242	DE83016274	MN -34	8:49514
37	*See* SAND-83-0773C	DE83016230	MN -25	8:49515
38	*See* UCRL-88754	DE83015690	MN -4	8:49505
40	*See* SAND-83-0654C	DE83016505	MN -34	8:49810
41	*See* LA-UR-83-2081	DE83015247	MN -34	8:49465
42	*See* UCRL-88755	DE83016364	MN -4	8:49506
CONF-830756-	(6. international zeolite conference, Reno, NV, USA, 10-15 Jul 1983)			
9	*See* IS-M-415	DE83016211	MN -25	8:49581
CONF-830763-	(9. AIRAPT conference, Albany, NY, USA, 25-29 Jul 1983)			
11	*See* SAND-83-0294C	DE83016247	MN -34A	8:49554

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CONF-830772-	(3. international conference on particle-induced X-ray emission (PIXE) and its analytical applications, Heidelberg, F.R. Germany, 18-22 Jul 1983)			
2	NTIS, PC A02/MF A01	DE83015682	MN -34D	8:50118
3	NTIS, PC A02/MF A01	DE83015699	MN -34D	8:50119
5	*See* BNL-33370	DE83016372	MN -28	8:49559
CONF-830773-	(58. Western Economic Association annual conference, Seattle, WA, USA, 20-24 Jul 1983)			
1	*See* PNL-SA-11430	DE83016209	MN -98	8:49237
2	*See* LBL-16386	DE83015657	MN -92	8:49265
3	*See* PNL-SA-10977	DE83016783	MN -95d	8:49442
CONF-830776-	(MIT short course on large-scale applications of superconductivity, Cambridge, MA, USA, 19 Jul 1983)			
2	NTIS, PC A03/MF A01; 1	DE83015506	MN -20	8:50391
CONF-830781-	(Harvard computer graphics conference, Cambridge, MA, USA, 27 Jul-4 Aug 1983)			
1	NTIS, PC A02/MF A01	DE83015718	MN -11	8:49866
CONF-830782-	(11. L. H. Gray conference on cellular repair of radiation damage - mechanisms and modifying agents, Glasgow, UK, 18-22 Jul 1983)			
1	NTIS, PC A02/MF A01	DE83015684	MN -48	8:50004
CONF-830783-	(Battery user's workshop, Washington, DC, USA, 20-21 Jul 1983)			
1	*See* SAND-83-1216C	DE83016231	MN -96	8:49460
CONF-830784-	(US/Japan seminar on piezoelectric polymers, Honolulu, HI, USA, 17-23 Jul 1983)			
1	*See* SAND-83-1592C	DE83015227	MN -4	8:49522
CONF-830785-	(3. international conference on oxygen radicals in chemistry and biology, Neuherberg, F.R. Germany, 10-15 Jul 1983)			
1	*See* BNL-33293	DE83014617	MN -4	8:49577
CONF-830786-	(Nuclear Science Advisory Committee (NSAC) long range planning session and NRC physics survey meeting, Pasadena, CA, USA, 1 Jul 1983)			
1	*See* UCRL-89382	DE83014872	MN -34C	8:50063
CONF-830788-	(Nuclear fuel cycle information workshop, Oak Ridge, TN, USA, 12-14 Jul 1983)			
1	NTIS, PC A02/MF A01	DE83015501	MN -86	8:48639
2	NTIS, PC A02/MF A01	DE83015731	MN -83	8:48628
5	NTIS, PC A02/MF A01	DE83015502	MN -71	8:48645
CONF-830805-	(7. international conference on structural mechanics in reactor technology, Chicago, IL, USA, 22-26 Aug 1983)			
46	*See* HEDL-SA-2728-FP	DE83015472	MN -79b	8:49022
47	*See* IS-M-417	DE83016518	MN -80	8:49071
48	*See* IS-M-416	DE83016517	MN -80	8:49176
CONF-830808-	(International solvent extraction conference, Denver, CO, USA, 26 Aug-2 Sep 1983)			
8	*See* LBL-15828	DE83015958	MN -4	8:49568
CONF-830810-	(DOE/FRG joint workshop on diffuse discharges, Bad Honneff, F.R. Germany, 15-18 Aug 1983)			
2	*See* SAND-83-1769C	DE83016504	MN -4	8:49647
CONF-830812-	(18. intersociety energy conversion engineering conference, Orlando, FL, USA, 21-26 Aug 1983)			
38	*See* LBL-16126	DE83015953	MN -95d	8:49428
CONF-830816-	(International meeting on light-water reactor severe accident evaluation, Cambridge, MA, USA, 28 Aug-1 Sep 1983)			
6	*See* SAND-83-0724C	DE83015670	MN -78	8:49203
10	*See* LA-UR-83-963	DE83015240	MN -78	8:49186
11	*See* SAND-83-1738C	DE83016223	MN -78	8:49211
12	*See* SAND-83-0841C	DE83016232	MN -78	8:49206
13	*See* SAND-83-1734C	DE83016160	MN -78	8:49208
14	*See* SAND-83-0831C	DE83016201	MN -78	8:49205
16	*See* SAND-83-1735C	DE83016300	MN -78	8:49209
19	*See* SAND-83-1737C	DE83016241	MN -78	8:49210
27	*See* SAND-83-0894C	DE83016507	MN -78	8:49207
29	*See* SAND-83-0791C	DE83016240	MN -78	8:49204
CONF-830818-	(11. biennial topical conference on reactor operating experience - plant startup and operations in the 80's, Scottsdale, AZ, USA, 1-3 Aug 1983)			
4	*See* HEDL-SA-2876	DE83016386	MN -79	8:49136
CONF-830822-	(12. international conference on high energy accelerators, Batavia, IL, USA, 11-16 Aug 1983)			
2	*See* LBL-16437	DE83016314	MN -28	8:49668
3	*See* LBL-16502	DE83016318	MN -28	8:49669
4	*See* BNL-33416	DE83016321	MN -28	8:49724
CONF-830827-	(9. annual symposium on underground coal gasification, Bloomingdale, IL, USA, 7-10 Aug 1983)			
5	*See* SAND-83-0891C	DE83016502	MN -90c	8:48521
6	*See* UCRL-89084	DE83016530	MN -90c	8:48526
7	*See* UCRL-89009	DE83016563	MN -90c	8:48525
CONF-830831-	(CRYPTO '83 conference, Santa Barbara, CA, USA, 21-24 Aug 1983)			
2	*See* SAND-83-1538C	DE83016762	MN -32	8:50441
CONF-830835-	(Energy efficient buildings with earth shelter protection, Sydney, Australia, 1-10 Aug 1983)			
1	*See* LBL-14959	DE83015992	MN -41	8:49832

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CONF-830841-	(Cryogenic engineering conference and international cryogenic materials conference, Colorado Springs, CO, USA, 15-19 Aug 1983)			
3	*See* UCRL-88696	DE83016275	MN -20b	8:50416
CONF-830845-	(Environmental degradation of materials in nuclear power systems-water reactors, Myrtle Beach, SC, USA, 22-24 Aug 1983)			
1	*See* BNL-NUREG-33385	DE83015770	MN -78	8:48984
CONF-830859-	(National meeting of the American Institute of Chemical Engineers, Denver, CO, USA, 28-31 Aug 1983)			
3	*See* SAND-83-1655A	DE83016246	MN -94cb	8:49225
4	*See* LBL-16511	DE83016603	MN -94cc	8:49224
CONF-830862-	(10. international conference on few-body problems in physics, Karlsruhe, F.R. Germany, 21-27 Aug 1983)			
2	*See* SLAC-PUB-3146	DE83014897	MN -34	8:50269
3	*See* SLAC-PUB-3147	DE83014896	MN -34D	8:50301
4	*See* DOE/ER/40048-12-N3	DE83015897	MN -34D	8:50181
6	*See* BNL-33502	DE83016698	MN -34A	8:50177
CONF-830874-	(27. annual international technical symposium on high speed photography, videography and photonics, San Diego, CA, USA, 21-26 Aug 1983)			
11	*See* UCRL-89422	DE83015902	MN -38	8:49811
12	*See* UCRL-89537	DE83015618	MN -21	8:50387
13	*See* UCRL-89603	DE83015844	MN -20a	8:50418
14	*See* UCRL-89649	DE83016192	MN -38	8:49635
15	*See* SAND-83-1474C	DE83016503	MN -25	8:49618
CONF-830882-	(2. containment symposium, Albuquerque, NM, USA, 2-4 Aug 1983)			
5	*See* UCRL-89414	DE83016574	MN -11	8:50096
6	*See* UCRL-89411	DE83016565	MN -11	8:49816
CONF-830888-	(5. international conference on liquid and amorphous metals, Los Angeles, CA, USA, 15-19 Aug 1983)			
5	*See* PNL-SA-11292	DE83016815	MN -25	8:49501
CONF-830895-	(10. international conference on amorphous and liquid semiconductors, Tokyo, Japan, 22 Aug 1983)			
1	*See* UCRL-89444	DE83015245	MN -4	8:49516
2	*See* BNL-33440	DE83016700	MN -4	8:49524
CONF-830902-	(NATO human factors meeting on the theory and nature of human error, Bellagio, Italy, 5-10 Sep 1983)			
1	*See* SAND-83-0447C	DE83009292	MN -80	8:49202
CONF-830905-	(Joint power generation conference, Indianapolis, IN, USA, 25-29 Sep 1983)			
5	NTIS, PC A02/MF A01; 3	DE83015537	ND -79k	8:49019
CONF-830908-	(11. European conference on controlled fusion and plasma physics, Aachen, F.R. Germany, 5-9 Sep 1983)			
3	*See* GA-A-17142	DE83015872	MN -20f	8:50399
4	*See* GA-A-17144	DE83015873	MN -20a	8:50400
CONF-830909-	(Course and workshop on mirror-based and field-reversed approaches to magnetic fusion, Varenna, Italy, 7-17 Sep 1983)			
1	*See* UCRL-89199	DE83016368	MN -20f	8:50417
2	*See* UCRL-89200	DE83016568	MN -20b	8:50386
CONF-830920-	(7. symposium on sources and ion assisted technology and 4. international conference on ion and plasma assisted techniques, Kyoto, Japan, 12-16 Sep 1983)			
5	*See* LBL-16222	DE83016001	MN -20a	8:50405
7	*See* LBL-16327	DE83016620	MN -34D	8:50153
CONF-830927-	(7. international conference on crystal growth, Stuttgart, F.R. Germany, 12-26 Sep 1983)			
2	NTIS, PC A02/MF A01; 1	DE83016731	MN -37	8:49739
CONF-830928-	(9. ASME biennial conference on mechanical vibration and noise, Dearborn, MI, USA, 12-14 Sep 1983)			
1	*See* UNI-SA-106	DE83012123	MN -80	8:49132
CONF-830932-	(International conference on numerical methods in nuclear engineering, Montreal, Canada, 6-9 Sep 1983)			
5	NTIS, PC A02/MF A01; 1	DE83014742	MN -78	8:49133
CONF-830974-	(Physical and chemical energy storage annual contractor's review meeting, Arlington, VA, USA, 12-14 Sep 1983)			
1	*See* PNL-SA-11559	DE83016797	MN -94e	8:49217
CONF-8309115-	(6. international system safety conference, Houston, TX, USA, 26-30 Sep 1983)			
3	*See* UCRL-89089	DE83016564	MN -41	8:50085
CONF-8309124-	(1. international conference on the chemistry and technology of the lanthanides and actinides, Venice, Italy, 5-10 Sep 1983)			
1	*See* LBL-16234	DE83015935	MN -4	8:49553
2	*See* LBL-16441	DE83016708	MN -4	8:49585
CONF-8309125-	(Annual practical conference on communication, Knoxville, TN, USA, 29 Sep-1 Oct 1983)			
1	*See* SAND-83-1648C	DE83015624	MN -13	8:50428
CONF-8309130-	(14. international technical meeting on air pollution modeling and its applications, Copenhagen, Denmark, 27-30 Sep 1983)			
1	*See* UCRL-88605	DE83016365	MN -11	8:49840
CONF-831063-	(American Institute of Chemical Engineers fall annual meeting, Washington, DC, USA, 30 Oct-3 Nov 1983)			
3	*See* BNL-33441	DE83016371	MN -11	8:49827

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1	*See* Y/CP-17	DE83015481	MN -32	8:49253
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2218-273	*See* DOE/ET/52040-T14	DE83016554	MN -20a	8:50373
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82-03	NTIS (US Sales Only), PC A05/MF A01	DE83703424	MN -34C	8:50276
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9	NTIS (US Sales Only), PC A02/MF A01; 1	DE83750984	MN -95d	8:49416
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1	NTIS (US Sales Only), PC A04/MF A01	DE83702350	MN -2	8:49049
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266	NTIS (US Sales Only), PC A02/MF A01	DE83780872	MN -34	8:50207
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55-1	NTIS (US Sales Only), PC A08/MF A01; 1	DE83750976	MN -13	8:49245
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56	NTIS (US Sales Only), PC A04/MF A01	DE83750978	MN -13	8:49247
57	NTIS (US Sales Only), PC A04/MF A01	DE83750979	MN -13	8:49248
58	NTIS (US Sales Only), PC A07/MF A01; 1	DE83750980	MN -90	8:48506
59	NTIS (US Sales Only), PC A04/MF A01	DE83750981	MN -95f	8:48816
60	NTIS (US Sales Only), PC A04/MF A01	DE83750982	MN -93	8:49249
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18	NTIS (US Sales Only), PC A06/MF A01	DE83781072	MN -34A	8:50139
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1	NTIS, PC A03/MF A01	DE83016425	STD -96	8:49462
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8	NTIS, PC A05/MF A01	DE83015656	STD -92a	8:48594
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83/ 2	NTIS, PC A05/MF A01	DE83017026	STD -92a	8:48595
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2	NTIS, PC A03/MF A01	DE83015398	STD -95e	8:49454
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8	NTIS, PC A06/MF A01	DE83016552	MN -95	8:49417
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T2	NTIS, PC A09/MF A01	DE83016058	MN -95d	8:49418
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T3	NTIS, PC A03/MF A01	DE83016377	MN -95f	8:49451
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12	NTIS, PC A04/MF A01	DE83015658	STD -96	8:49459
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T24	NTIS, PC A05/MF A01	DE83016281	STD -78	8:49134
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T7	NTIS, PC A02/MF A01	DE83016075	MN -70A	8:49125
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123	NTIS (US Sales Only), PC A04/MF A01	DE83702351	MN -2	8:49251
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126	NTIS (US Sales Only), PC A14/MF A01	DE83702334	MN -79	8:49135
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26	NTIS (US Sales Only), PC A05/MF A01	DE83702347	MN -2	8:49045
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EPRI-EA-				
2048-Vol.5	NTIS, PC A17/MF A01; 1	DE83902946	MN -11	8:49830
3015	NTIS, PC A12/MF A01; 1	DE83902648	MN -90	8:48956
EPRI-NP-				
3063-CCM-Vol.2	NTIS PC E05/MF A01	DE83902944	MN -32	8:48986
3167	NTIS, PC A07/MF A01; 1	DE83902701	MN -79	8:49021
ESG-DOE-				
13405	NTIS, PC A10/MF A01; 1	DE83016149	STD -90	8:48515
ETEC-				
82-19	NTIS, PC A19/MF A01; 1	DE83016337	STD -64	8:48902
EUR-				
7371-FR	*See* PB-83-198903			8:48676
7596-DE	*See* PB-83-203190			8:49586
7654-DE	*See* PB-83-199778			8:48677
7685-EN-FR	*See* PB-83-195362			8:48776
7771-DE	*See* PB-83-200436			8:48643
7793-EN	*See* PB-83-200584			8:49596
7795-EN	*See* PB-83-198887			8:48838
8054-EN	*See* PB-83-199331			8:49267
8165-DE	Commission of the European Communities, Luxembourg			8:48908
FERMILAB-Conf-				
82/ 55-THY	NTIS, PC A03/MF A01; 1	DE83015649	MN -28	8:49732
FJSRL-TR-				
83-0003	*See* AD-A-126776/4			8:49636
FRNC-TH-				
1092	NTIS (US Sales Only), PC A13/MF A01	DE83702812	MN -34D	8:49672
1095	NTIS (US Sales Only), PC A07/MF A01	DE83702815	MN -37	8:49533
1098	NTIS (US Sales Only), PC A05/MF A01	DE83702794	MN -38	8:49637
FSGTR-NC-				
78	*See* PB-83-175646			8:48837
GA-A-				
17142	NTIS, PC A02/MF A01	DE83015872	MN -20f	8:50399
17144	NTIS, PC A02/MF A01	DE83015873	MN -20a	8:50400
GCA-TR-				
82-36-G	*See* PB-83-202010			8:48577

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GE-				
380/ 77	See PB-83-197632			8:48926
GTFR-				
42	NTIS, PC A02/MF A01	DE83016153	MN -20	8:50375
HEDL-SA-				
2728-FP	NTIS, PC A02/MF A01	DE83015472	MN -79b	8:49022
2876	NTIS, PC A03/MF A01; 1	DE83016386	MN -79	8:49136
IA-				
1366	NTIS (US Sales Only), PC A04/MF A01	DE83702324	MN -22	8:48751
1367	NTIS (US Sales Only), PC A02/MF A01	DE83702309	MN -25	8:49471
1368	NTIS (US Sales Only), PC A06/MF A01	DE83702329	MN -80	8:49050
1369	NTIS (US Sales Only), PC A06/MF A01	DE83702252	MN -34A	8:49534
1371	NTIS (US Sales Only), PC A08/MF A01	DE83702253	MN -34A	8:49535
1372	NTIS (US Sales Only), PC A04/MF A01	DE83702254	MN -34A	8:49536
IAEA-NDS-				
28	NTIS (US Sales Only), PC A02/MF A01	DE83701476	MN -32	8:50256
29	NTIS (US Sales Only), PC A02/MF A01	DE83701477	MN -32	8:50257
36	NTIS (US Sales Only), PC A02/MF A01	DE83701478	MN -32	8:50308
39	NTIS (US Sales Only), PC A03/MF A01	DE83701479	MN -32	8:50258
IAEA-R-				
1724-F	NTIS (US Sales Only), PC A03/MF A01	DE83701482	MN -2	8:49874
1938-F	NTIS (US Sales Only), PC A02/MF A01	DE83702317	MN -48	8:49880
2185-F	NTIS (US Sales Only), PC A02/MF A01	DE83701483	MN -2	8:49856
2347-F	NTIS (US Sales Only), PC A05/MF A01	DE83702318	MN -48	8:50011
2499-F	NTIS (US Sales Only), PC A05/MF A01	DE83703425	MN -34C	8:50278
IAEA-TECDOC-				
265	NTIS (US Sales Only), PC A09/MF A01	DE83780705	MN -11	8:49881
267	NTIS (US Sales Only), PC A09/MF A01	DE83702409	MN -48	8:49999
268	NTIS (US Sales Only), PC A07/MF A01	DE83702408	MN -48	8:50018
IC-				
81/ 149	NTIS (US Sales Only), PC A03/MF A01	DE83702311	MN -34B	8:49820
81/ 151	NTIS (US Sales Only), PC A04/MF A01	DE83702228	MN -34D	8:50228
81/ 152	NTIS (US Sales Only), PC A04/MF A01	DE83702229	MN -34D	8:50229
81/ 158	NTIS (US Sales Only), PC A02/MF A01	DE83702230	MN -34D	8:50230
81/ 162	NTIS (US Sales Only), PC A02/MF A01	DE83702231	MN -34D	8:50326
81/ 164	NTIS (US Sales Only), PC A02/MF A01	DE83702269	MN -34A	8:49482
81/ 166	NTIS (US Sales Only), PC A02/MF A01	DE83702232	MN -34D	8:50231
81/ 168	NTIS (US Sales Only), PC A02/MF A01	DE83702270	MN -34A	8:50324
81/ 172	NTIS (US Sales Only), PC A02/MF A01	DE83702233	MN -34D	8:50232
81/ 183	NTIS (US Sales Only), PC A02/MF A01	DE83702255	MN -34A	8:50318
81/ 187	NTIS (US Sales Only), PC A03/MF A01	DE83702271	MN -34D	8:50233
81/ 188	NTIS (US Sales Only), PC A02/MF A01	DE83702234	MN -34D	8:50319
81/ 189	NTIS (US Sales Only), PC A03/MF A01	DE83702235	MN -34D	8:50327
81/ 193	NTIS (US Sales Only), PC A02/MF A01	DE83702236	MN -34D	8:50328
81/ 195	NTIS (US Sales Only), PC A02/MF A01	DE83702237	MN -34D	8:50329
81/ 199	NTIS (US Sales Only), PC A02/MF A01	DE83702238	MN -34D	8:50363
81/ 200	NTIS (US Sales Only), PC A02/MF A01	DE83702239	MN -34D	8:50234
81/ 204	NTIS (US Sales Only), PC A02/MF A01	DE83702240	MN -34D	8:50208
81/ 221	NTIS (US Sales Only), PC A03/MF A01	DE83702241	MN -34D	8:50105
81/ 228	NTIS (US Sales Only), PC A02/MF A01	DE83702242	MN -34D	8:50364
82/ 44	NTIS (US Sales Only), PC A02/MF A01	DE83702442	MN -32	8:50430
82/ 45	NTIS (US Sales Only), PC A02/MF A01	DE83702443	MN -32	8:50431
82/ 63	NTIS (US Sales Only), PC A03/MF A01	DE83702473	MN -34D	8:50235
82/ 69	NTIS (US Sales Only), PC A02/MF A01	DE83702444	MN -32	8:50432
82/ 75	NTIS (US Sales Only), PC A02/MF A01	DE83702474	MN -34D	8:50330
82/ 76	NTIS (US Sales Only), PC A02/MF A01	DE83702475	MN -34D	8:50331
82/ 77	NTIS (US Sales Only), PC A02/MF A01	DE83702476	MN -34D	8:50332
82/ 78	NTIS (US Sales Only), PC A03/MF A01	DE83702477	MN -34D	8:50333
82/ 79	NTIS (US Sales Only), PC A03/MF A01	DE83702478	MN -34D	8:50236
82/ 83	NTIS (US Sales Only), PC A02/MF A01	DE83703417	MN -34C	8:50297
82/ 86	NTIS (US Sales Only), PC A02/MF A01	DE83702479	MN -34D	8:50334
82/ 88	NTIS (US Sales Only), PC A02/MF A01	DE83702480	MN -34D	8:50335
82/ 94	NTIS (US Sales Only), PC A02/MF A01	DE83702481	MN -34D	8:50336
82/ 96	NTIS (US Sales Only), PC A02/MF A01	DE83702482	MN -34D	8:50365
82/ 105	NTIS (US Sales Only), PC A02/MF A01	DE83702453	MN -34D	8:50209
82/ 106	NTIS (US Sales Only), PC A02/MF A01	DE83702454	MN -34D	8:50237
82/ 107	NTIS (US Sales Only), PC A02/MF A01	DE83702455	MN -34D	8:50337
82/ 109	NTIS (US Sales Only), PC A02/MF A01	DE83702456	MN -34D	8:50366
82/ 114	NTIS (US Sales Only), PC A02/MF A01	DE83702457	MN -34D	8:50210
82/ 116	NTIS (US Sales Only), PC A02/MF A01	DE83702458	MN -34D	8:50211
82/ 119	NTIS (US Sales Only), PC A02/MF A01	DE83702459	MN -34D	8:50106
82/ 126	NTIS (US Sales Only), PC A02/MF A01	DE83702515	MN -34A	8:49483
82/ 130	NTIS (US Sales Only), PC A02/MF A01	DE83702460	MN -34D	8:50238
82/ 143	NTIS (US Sales Only), PC A02/MF A01	DE83702461	MN -34D	8:50338
82/ 144	NTIS (US Sales Only), PC A02/MF A01	DE83702462	MN -34D	8:50212
82/ 148	NTIS (US Sales Only), PC A02/MF A01	DE83702463	MN -34D	8:50367
82/ 160	NTIS (US Sales Only), PC A02/MF A01	DE83702464	MN -34D	8:50339
82/ 162	NTIS (US Sales Only), PC A02/MF A01	DE83702465	MN -34D	8:50340
82/ 167	NTIS (US Sales Only), PC A02/MF A01	DE83702516	MN -34A	8:50320
82/ 168	NTIS (US Sales Only), PC A02/MF A01	DE83702517	MN -34A	8:50321
82/ 184	NTIS (US Sales Only), PC A02/MF A01	DE83702466	MN -34D	8:50341
82/ 193	NTIS (US Sales Only), PC A02/MF A01	DE83702467	MN -34D	8:50213
82/ 195	NTIS (US Sales Only), PC A02/MF A01	DE83702468	MN -34D	8:50342
82/ 203	NTIS (US Sales Only), PC A02/MF A01	DE83702469	MN -34D	8:50368
82/ 204	NTIS (US Sales Only), PC A02/MF A01	DE83702470	MN -34D	8:50343

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82/ 208	NTIS (US Sales Only), PC A03/MF A01	DE83702471	MN -34D	8:50344
82/ 212	NTIS (US Sales Only), PC A02/MF A01	DE83702472	MN -34D	8:50345
82/ 214	NTIS (US Sales Only), PC A02/MF A01	DE83703416	MN -34C	8:50298
IDO-				
10054(82)	NTIS, PC A04/MF A01; 1	DE83016864	MN -70	8:48663
10055(82)	NTIS, PC A13/MF A01; 1	DE83016863	MN -70	8:48664
IFVE-NTL-				
81-164	NTIS (US Sales Only), PC A03/MF A01	DE83703400	MN -34D	8:50214
IFVE-OEIPE-				
82-156	NTIS (US Sales Only), PC A02/MF A01	DE83703410	MN -34D	8:50165
IFVE-OTF-				
82-35	NTIS (US Sales Only), PC A02/MF A01	DE83702486	MN -34D	8:50215
82-36	NTIS (US Sales Only), PC A02/MF A01	DE83702487	MN -34D	8:50346
82-39	NTIS (US Sales Only), PC A02/MF A01	DE83702488	MN -34D	8:50185
82-79	NTIS (US Sales Only), PC A02/MF A01	DE83702489	MN -34D	8:50347
82-104	NTIS (US Sales Only), PC A02/MF A01	DE83702483	MN -34D	8:50239
82-126	NTIS (US Sales Only), PC A02/MF A01	DE83703401	MN -34D	8:50186
82-127	NTIS (US Sales Only), PC A02/MF A01	DE83702484	MN -34D	8:50240
82-147	NTIS (US Sales Only), PC A02/MF A01	DE83702485	MN -34D	8:50216
IHEP-ONF-				
82-32	NTIS (US Sales Only), PC A02/MF A01	DE83703402	MN -34D	8:50217
IHZ-IML-				
81-340	Fachinformationszentrum Energie, Physik, Mathematik, Karlsruhe, Germany			8:49272
INDC(CCP)-				
178/ L	NTIS (US Sales Only), PC A02/MF A01	DE83703426	MN -34C	8:50292
INDC(NDS)-				
137/ GA	NTIS (US Sales Only), PC A02/MF A01	DE83702509	MN -34A	8:50145
INFN-LNF-				
78/ 8(R)	NTIS (US Sales Only), PC A02/MF A01	DE83702394	MN -34C	8:49715
78/ 31(R)	NTIS (US Sales Only), PC A02/MF A01	DE83702419	MN -23	8:49716
78/ 34(R)	NTIS (US Sales Only), PC A02/MF A01	DE83702393	MN -34C	8:49717
78/ 39(R)	NTIS (US Sales Only), PC A02/MF A01	DE83702410	MN -41	8:49666
INIS-BR-				
04	NTIS (US Sales Only), PC A02/MF A01	DE83702759	MN -51	8:50097
05	NTIS (US Sales Only), PC A21/MF A01	DE83781073	MN -41	8:50075
08	NTIS (US Sales Only), PC A05/MF A01	DE83702770	MN -11	8:49843
09	NTIS (US Sales Only), PC A11/MF A01	DE83702796	MN -46	8:49623
INIS-mf-				
7781(Vol.1)	NTIS (US Sales Only), PC A09/MF A01	DE83780964	MN -48	8:49952
7781(Vol.2)	NTIS (US Sales Only), PC A09/MF A01	DE83780946	MN -48	8:49953
7781(Vol.3)	NTIS (US Sales Only), PC A09/MF A01	DE83780943	MN -48	8:50027
7892	NTIS (US Sales Only), PC A08/MF A01	DE83780945	MN -48	8:49914
7894	NTIS (US Sales Only), PC A02/MF A01	DE83780750	MN -38	8:49792
7895	NTIS (US Sales Only), PC A02/MF A01	DE83780751	MN -38	8:49793
7896	NTIS (US Sales Only), PC A02/MF A01	DE83780752	MN -38	8:49794
7897	NTIS (US Sales Only), PC A02/MF A01	DE83780753	MN -38	8:49795
7898	NTIS (US Sales Only), PC A02/MF A01	DE83780754	MN -79	8:49796
7899	NTIS (US Sales Only), PC A02/MF A01	DE83780755	MN -38	8:49797
7900	NTIS (US Sales Only), PC A02/MF A01	DE83780756	MN -38	8:49798
7901	NTIS (US Sales Only), PC A02/MF A01	DE83780757	MN -38	8:49799
7902	NTIS (US Sales Only), PC A02/MF A01	DE83780758	MN -38	8:49800
7903	NTIS (US Sales Only), PC A02/MF A01	DE83780759	MN -80	8:49801
7904	NTIS (US Sales Only), PC A02/MF A01	DE83780760	MN -38	8:49802
7905	NTIS (US Sales Only), PC A02/MF A01	DE83780761	MN -79	8:49023
7906	NTIS (US Sales Only), PC A02/MF A01	DE83780762	MN -38	8:49057
7907	NTIS (US Sales Only), PC A02/MF A01	DE83780763	MN -38	8:49803
7908	NTIS (US Sales Only), PC A02/MF A01	DE83780764	MN -38	8:49591
7909	NTIS (US Sales Only), PC A02/MF A01	DE83780765	MN -38	8:49152
7910	NTIS (US Sales Only), PC A02/MF A01	DE83780766	MN -80	8:49012
7911	NTIS (US Sales Only), PC A03/MF A01	DE83780767	MN -79	8:49075
7912	NTIS (US Sales Only), PC A02/MF A01	DE83780768	MN -38	8:49013
7913	NTIS (US Sales Only), PC A02/MF A01	DE83702352	MN -2	8:49052
7923	NTIS (US Sales Only), PC A02/MF A01	DE83780746	MN -80	8:49053
7928	NTIS (US Sales Only), PC A03/MF A01	DE83780775	MN -80	8:49033
7930	NTIS (US Sales Only), PC A04/MF A01	DE83780776	MN -80	8:49034
7931	NTIS (US Sales Only), PC A02/MF A01	DE83780733	MN -80	8:48959
7932	NTIS (US Sales Only), PC A03/MF A01	DE83780710	MN -80	8:48977
7933	NTIS (US Sales Only), PC A02/MF A01	DE83780711	MN -80	8:49153
7934	NTIS (US Sales Only), PC A02/MF A01	DE83780712	MN -80	8:49083
7935	NTIS (US Sales Only), PC A02/MF A01	DE83780713	MN -80	8:49084
7936	NTIS (US Sales Only), PC A02/MF A01	DE83780747	MN -80	8:49154
7937	NTIS (US Sales Only), PC A03/MF A01	DE83780714	MN -80	8:49085
7938	NTIS (US Sales Only), PC A02/MF A01	DE83780715	MN -80	8:49086
7939	NTIS (US Sales Only), PC A05/MF A01	DE83780716	MN -80	8:49087
7943	NTIS (US Sales Only), PC A03/MF A01	DE83780717	MN -80	8:49088
7944	NTIS (US Sales Only), PC A03/MF A01	DE83780734	MN -80	8:48960
7945	NTIS (US Sales Only), PC A02/MF A01	DE83780742	MN -78	8:48990
7948	NTIS (US Sales Only), PC A03/MF A01	DE83780718	MN -80	8:49089
7949	NTIS (US Sales Only), PC A02/MF A01	DE83780719	MN -80	8:49090
7950	NTIS (US Sales Only), PC A04/MF A01	DE83780720	MN -80	8:49091
7951	NTIS (US Sales Only), PC A02/MF A01	DE83780721	MN -80	8:49092
7952	NTIS (US Sales Only), PC A02/MF A01	DE83780743	MN -78	8:48991
7956	NTIS (US Sales Only), PC A02/MF A01	DE83780748	MN -80	8:49058
7957	NTIS (US Sales Only), PC A02/MF A01	DE83780749	MN -80	8:49059

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7958	NTIS (US Sales Only), PC A03/MF A01	DE83780722	MN -80	8:49093
7959	NTIS (US Sales Only), PC A05/MF A01	DE83780723	MN -80	8:49094
7965	NTIS (US Sales Only), PC A02/MF A01	DE83780801	MN -2	8:48961
7966	NTIS (US Sales Only), PC A02/MF A01	DE83780769	MN -80	8:48962
7971	NTIS (US Sales Only), PC A03/MF A01	DE83780744	MN -78	8:48992
7972	NTIS (US Sales Only), PC A05/MF A01	DE83780724	MN -78	8:49155
7973	NTIS (US Sales Only), PC A04/MF A01	DE83780725	MN -78	8:49095
7974	NTIS (US Sales Only), PC A02/MF A01	DE83780726	MN -80	8:49060
7975	NTIS (US Sales Only), PC A03/MF A01	DE83780777	MN -78	8:49035
7976	NTIS (US Sales Only), PC A03/MF A01	DE83780745	MN -78	8:48993
7978	NTIS (US Sales Only), PC A03/MF A01	DE83780778	MN -80	8:49036
7981	NTIS (US Sales Only), PC A02/MF A01	DE83780798	MN -2	8:48963
7982	NTIS (US Sales Only), PC A04/MF A01	DE83780770	MN -13	8:49232
7984	NTIS (US Sales Only), PC A04/MF A01	DE83780741	MN -86	8:49046
7985	NTIS (US Sales Only), PC A02/MF A01	DE83780784	MN -41	8:48756
7986	NTIS (US Sales Only), PC A02/MF A01	DE83780707	MN -38	8:49061
7988	NTIS (US Sales Only), PC A02/MF A01	DE83780708	MN -80	8:49076
7999	NTIS (US Sales Only), PC A02/MF A01	DE83780799	MN -80	8:48964
8002	NTIS (US Sales Only), PC A02/MF A01	DE83780727	MN -80	8:49062
8003	NTIS (US Sales Only), PC A03/MF A01	DE83780728	MN -80	8:49063
8005	NTIS (US Sales Only), PC A02/MF A01	DE83780735	MN -80	8:48965
8006	NTIS (US Sales Only), PC A02/MF A01	DE83780736	MN -80	8:48966
8007	NTIS (US Sales Only), PC A02/MF A01	DE83780709	MN -80	8:49064
8008	NTIS (US Sales Only), PC A02/MF A01	DE83780737	MN -80	8:48967
8009	NTIS (US Sales Only), PC A03/MF A01	DE83780729	MN -78	8:48994
8010	NTIS (US Sales Only), PC A02/MF A01	DE83780771	MN -80	8:49255
8011	NTIS (US Sales Only), PC A03/MF A01	DE83780730	MN -78	8:49096
8012	NTIS (US Sales Only), PC A03/MF A01	DE83780731	MN -80	8:49097
8013	NTIS (US Sales Only), PC A02/MF A01	DE83780738	MN -80	8:48968
8014	NTIS (US Sales Only), PC A02/MF A01	DE83780739	MN -80	8:48969
8015	NTIS (US Sales Only), PC A03/MF A01	DE83780732	MN -78	8:48978
8016	NTIS (US Sales Only), PC A02/MF A01	DE83780779	MN -80	8:49037
8019	NTIS (US Sales Only), PC A02/MF A01	DE83780740	MN -80	8:48970
8025	NTIS (US Sales Only), PC A02/MF A01	DE83780793	MN -2	8:49156
8026	NTIS (US Sales Only), PC A02/MF A01	DE83780789	MN -71	8:49624
8027	NTIS (US Sales Only), PC A02/MF A01	DE83780794	MN -2	8:49038
8028	NTIS (US Sales Only), PC A02/MF A01	DE83780774	MN -48	8:49954
8029	NTIS (US Sales Only), PC A02/MF A01	DE83780780	MN -11	8:49118
8030	NTIS (US Sales Only), PC A02/MF A01	DE83780785	MN -48	8:50028
8031	NTIS (US Sales Only), PC A02/MF A01	DE83780792	MN -2	8:49157
8032	NTIS (US Sales Only), PC A02/MF A01	DE83780786	MN -41	8:49955
8034	NTIS (US Sales Only), PC A02/MF A01	DE83780787	MN -41	8:49956
8035	NTIS (US Sales Only), PC A02/MF A01	DE83780781	MN -11	8:49119
8036	NTIS (US Sales Only), PC A02/MF A01	DE83780788	MN -41	8:49898
8037	NTIS (US Sales Only), PC A02/MF A01	DE83780795	MN -2	8:49039
8038	NTIS (US Sales Only), PC A03/MF A01	DE83780790	MN -71	8:49625
8039	NTIS (US Sales Only), PC A02/MF A01	DE83780791	MN -71	8:49626
8040	NTIS (US Sales Only), PC A02/MF A01	DE83780782	MN -28	8:49655
8041	NTIS (US Sales Only), PC A02/MF A01	DE83780772	MN -2	8:48971
8042	NTIS (US Sales Only), PC A02/MF A01	DE83780773	MN -2	8:48972
8043	NTIS (US Sales Only), PC A02/MF A01	DE83780796	MN -13	8:49262
8044	NTIS (US Sales Only), PC A02/MF A01	DE83780783	MN -80	8:49040
8045	NTIS (US Sales Only), PC A02/MF A01	DE83780797	MN -2	8:49041
8086	NTIS (US Sales Only), PC A05/MF A01	DE83702788	MN -48	8:49957
8087	NTIS (US Sales Only), PC A05/MF A01	DE83702765	MN -48	8:50029
8088	NTIS (US Sales Only), PC A06/MF A01	DE83702789	MN -48	8:49958
8089	NTIS (US Sales Only), PC A04/MF A01	DE83702793	MN -48	8:49959
8090	NTIS (US Sales Only), PC A04/MF A01	DE83702787	MN -48	8:49960
8091	NTIS (US Sales Only), PC A03/MF A01	DE83702790	MN -48	8:49961
8093	NTIS (US Sales Only), PC A13/MF A01	DE83702766	MN -48	8:49928
8095	NTIS (US Sales Only), PC A02/MF A01	DE83702771	MN -41	8:49903
8096	NTIS (US Sales Only), PC A02/MF A01	DE83702772	MN -41	8:49158
8097	NTIS (US Sales Only), PC A03/MF A01	DE83702773	MN -41	8:49159
8098	NTIS (US Sales Only), PC A03/MF A01	DE83702761	MN -2	8:49904
8099	NTIS (US Sales Only), PC A03/MF A01	DE83702762	MN -2	8:49844
8100	NTIS (US Sales Only), PC A02/MF A01	DE83702785	MN -41	8:50030
8101	NTIS (US Sales Only), PC A04/MF A01	DE83702816	MN -70	8:48665
8103	NTIS (US Sales Only), PC A03/MF A01	DE83702774	MN -41	8:49910
8104	NTIS (US Sales Only), PC A02/MF A01	DE83702797	MN -80	8:49160
8105	NTIS (US Sales Only), PC A02/MF A01	DE83702798	MN -80	8:49065
8106	NTIS (US Sales Only), PC A02/MF A01	DE83702775	MN -41	8:49161
8107	NTIS (US Sales Only), PC A04/MF A01	DE83702767	MN -48	8:49962
8112	NTIS (US Sales Only), PC A03/MF A01	DE83702776	MN -41	8:49162
8113	NTIS (US Sales Only), PC A02/MF A01	DE83702777	MN -41	8:49163
8114	NTIS (US Sales Only), PC A02/MF A01	DE83702799	MN -80	8:49066
8115	NTIS (US Sales Only), PC A02/MF A01	DE83702800	MN -80	8:49164
8116	NTIS (US Sales Only), PC A02/MF A01	DE83702778	MN -41	8:49165
8117	NTIS (US Sales Only), PC A02/MF A01	DE83702779	MN -41	8:49166
8118	NTIS (US Sales Only), PC A04/MF A01	DE83702780	MN -41	8:49167
8119	NTIS (US Sales Only), PC A03/MF A01	DE83702801	MN -80	8:49067
8120	NTIS (US Sales Only), PC A04/MF A01	DE83702810	MN -78	8:48995
8121	NTIS (US Sales Only), PC A02/MF A01	DE83702781	MN -41	8:49168
8122	NTIS (US Sales Only), PC A03/MF A01	DE83702802	MN -80	8:49077
8123	NTIS (US Sales Only), PC A02/MF A01	DE83702803	MN -80	8:49068
8124	NTIS (US Sales Only), PC A02/MF A01	DE83702804	MN -80	8:49069

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8125	NTIS (US Sales Only), PC A02/MF A01	DE83702805	MN -80	8:48979
8126	NTIS (US Sales Only), PC A02/MF A01	DE83702806	MN -80	8:49070
8127	NTIS (US Sales Only), PC A03/MF A01	DE83702807	MN -80	8:49169
8128	NTIS (US Sales Only), PC A11/MF A01	DE83702763	MN -48	8:50031
8129	NTIS (US Sales Only), PC A04/MF A01	DE83702782	MN -41	8:49170
8130	NTIS (US Sales Only), PC A03/MF A01	DE83702783	MN -41	8:49171
8131	NTIS (US Sales Only), PC A03/MF A01	DE83781074	MN -80	8:49173
8133	NTIS (US Sales Only), PC A06/MF A01	DE83702814	MN -37	8:49804
8134	NTIS (US Sales Only), PC A02/MF A01	DE83702819	MN -02	8:50086
8135	NTIS (US Sales Only), PC A10/MF A01	DE83702820	MN -02	8:50259
8136	NTIS (US Sales Only), PC A07/MF A01	DE83702813	MN -37	8:49748
8137	NTIS (US Sales Only), PC A17/MF A01	DE83781075	MN -48	8:49987
8138	NTIS (US Sales Only), PC A24/MF A01	DE83702811	MN -78	8:49174
8140	NTIS (US Sales Only), PC A02/MF A01	DE83702786	MN -41	8:50032
8142	NTIS (US Sales Only), PC A03/MF A01	DE83702817	MN -02	8:49256
8144	NTIS (US Sales Only), PC A05/MF A01	DE83702791	MN -48	8:49988
8145	NTIS (US Sales Only), PC A05/MF A01	DE83702795	MN -28	8:49718
8147	NTIS (US Sales Only), PC A03/MF A01	DE83702764	MN -48	8:50033
8148	NTIS (US Sales Only), PC A04/MF A01	DE83702768	MN -48	8:50066
8149	NTIS (US Sales Only), PC A04/MF A01	DE83702769	MN -48	8:49989
8150	NTIS (US Sales Only), PC A03/MF A01	DE83702792	MN -48	8:50312
8151	NTIS (US Sales Only), PC A06/MF A01	DE83702818	MN -77	8:49257
8152	NTIS (US Sales Only), PC A05/MF A01	DE83702760	MN -11	8:48592
8155	NTIS (US Sales Only), PC A02/MF A01	DE83702784	MN -41	8:49175
INIS-SU-				
135	NTIS (US Sales Only), PC A16/MF A01	DE83780873	MN -34A	8:50147
INT-				
164/ E	NTIS (US Sales Only), PC A02/MF A01	DE83702325	MN -23	8:49627
IS-				
4816	NTIS, PC A03/MF A01	DE83016405	MN -90	8:48531
4823	NTIS, PC A06/MF A01; 1	DE83016796	MN -90i	8:48538
4835	NTIS, PC A04/MF A01	DE83016755	MN -90	8:48532
4837	NTIS, PC A03/MF A01; 1	DE83016794	MN -90i	8:48539
IS-M-				
415	NTIS, PC A02/MF A01	DE83016211	MN -25	8:49581
416	NTIS, PC A02/MF A01; 1	DE83016517	MN -80	8:49176
417	NTIS, PC A02/MF A01; 1	DE83016518	MN -80	8:49071
419	NTIS, PC A02/MF A01	DE83016345	MN -4	8:49562
421	NTIS, PC A02/MF A01	DE83015892	MN -4	8:49563
422	NTIS, PC A02/MF A01	DE83016515	MN -34	8:49549
423	NTIS, PC A02/MF A01	DE83015211	MN -34	8:49550
425	NTIS, PC A02/MF A01	DE83016516	MN -4	8:49564
IS-RIC-PR-				
5	NTIS, PC A07/MF A01	DE83016407	MN -25	8:49485
IS-T-				
1046	NTIS, PC A07/MF A01	DE83016117	MN -4	8:49565
1051	NTIS, PC A11/MF A01	DE83016413	MN -4	8:50148
1054	NTIS, PC A07/MF A01; 1	DE83016131	MN -4	8:49582
1056	NTIS, PC A10/MF A01	DE83016141	MN -4	8:48579
1058	NTIS, PC A03/MF A01	DE83016142	MN -25	8:49486
1070	NTIS, PC A05/MF A01	DE83016414	MN -25	8:49628
1071	NTIS, PC A11/MF A01	DE83016144	MN -25	8:49487
1072	NTIS, PC A08/MF A01	DE83016118	MN -4	8:49566
1075	NTIS, PC A11/MF A01	DE83016146	MN -4	8:49583
ITEF-				
24(1982)	NTIS (US Sales Only), PC A04/MF A01	DE83702490	MN -34D	8:50348
ITEP-				
6(1982)	NTIS (US Sales Only), PC A02/MF A01	DE83702492	MN -34D	8:50241
79(1982)	NTIS (US Sales Only), PC A03/MF A01	DE83702493	MN -34D	8:50149
101(1982)	NTIS (US Sales Only), PC A04/MF A01	DE83702491	MN -34D	8:50349
ITP-				
82-94-E	NTIS (US Sales Only), PC A03/MF A01	DE83702494	MN -34D	8:50350
82-95-E	NTIS (US Sales Only), PC A02/MF A01	DE83702495	MN -34D	8:50218
JAERI-				
1274	NTIS (US Sales Only), PC A04/MF A01	DE83701475	MN -2	8:50433
1276	NTIS (US Sales Only), PC A04/MF A01	DE83702424	MN -80	8:49629
1277	NTIS (US Sales Only), PC A08/MF A01	DE83702428	MN -78	8:49177
JAERI-M-				
82-003	NTIS (US Sales Only), PC A02/MF A01	DE83702425	MN -78	8:49178
82-007	NTIS (US Sales Only), PC A03/MF A01	DE83702436	MN -37	8:48666
82-015	NTIS (US Sales Only), PC A02/MF A01	DE83702429	MN -78	8:49179
82-017	NTIS (US Sales Only), PC A11/MF A01	DE83702433	MN -80	8:49180
82-018	NTIS (US Sales Only), PC A06/MF A01	DE83702439	MN -2	8:50434
82-019	NTIS (US Sales Only), PC A04/MF A01	DE83702445	MN -32	8:50435
82-021	NTIS (US Sales Only), PC A13/MF A01	DE83702411	MN -41	8:49860
82-022	NTIS (US Sales Only), PC A04/MF A01	DE83702426	MN -78	8:49181
82-024	NTIS (US Sales Only), PC A03/MF A01	DE83702438	MN -70	8:48667
82-028	NTIS (US Sales Only), PC A05/MF A01	DE83702430	MN -78	8:49182
82-029	NTIS (US Sales Only), PC A05/MF A01	DE83702440	MN -2	8:50436
82-033	NTIS (US Sales Only), PC A03/MF A01	DE83702435	MN -37	8:49755
82-034	NTIS (US Sales Only), PC A04/MF A01	DE83702427	MN -78	8:48980
82-035	NTIS (US Sales Only), PC A04/MF A01	DE83702446	MN -32	8:50313
82-038	NTIS (US Sales Only), PC A04/MF A01	DE83702447	MN -32	8:49183
82-039	NTIS (US Sales Only), PC A10/MF A01	DE83702412	MN -41	8:49184
82-040	NTIS (US Sales Only), PC A05/MF A01	DE83702448	MN -32	8:50314

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82-041	NTIS (US Sales Only), PC A03/MF A01	DE83702449	MN -32	8:50437
82-042	NTIS (US Sales Only), PC A02/MF A01	DE83702420	MN -71	8:49078
82-047	NTIS (US Sales Only), PC A02/MF A01	DE83702417	MN -22	8:48753
82-048	NTIS (US Sales Only), PC A03/MF A01	DE83702418	MN -22	8:48754
82-049	NTIS (US Sales Only), PC A03/MF A01	DE83702402	MN -25	8:49488
82-061	NTIS (US Sales Only), PC A03/MF A01	DE83702400	MN -25	8:49489
82-073	NTIS (US Sales Only), PC A03/MF A01	DE83702431	MN -78	8:49185
9683	NTIS (US Sales Only), PC A15/MF A01	DE83701480	MN -32	8:49079
9908	NTIS (US Sales Only), PC A02/MF A01	DE83702414	MN -41	8:49875
9910	NTIS (US Sales Only), PC A03/MF A01	DE83701471	MN -70	8:48668
9942	NTIS (US Sales Only), PC A04/MF A01	DE83702423	MN -80	8:49014
9949	NTIS (US Sales Only), PC A03/MF A01	DE83702401	MN -25	8:49490
9957	NTIS (US Sales Only), PC A05/MF A01	DE83702421	MN -71	8:49630
9982	NTIS (US Sales Only), PC A02/MF A01	DE83701467	MN -37	8:49756
JEN-				
524	NTIS (US Sales Only), PC A04/MF A01	DE83702407	MN -48	8:49915
JINR-				
1-82-778	NTIS (US Sales Only), PC A02/MF A01	DE83703411	MN -34D	8:50166
13-82-148	NTIS (US Sales Only), PC A02/MF A01	DE83702337	MN -37	8:49805
D-1-82-116	NTIS (US Sales Only), PC A02/MF A01	DE83702292	MN -34D	8:50167
E-1-82-446	NTIS (US Sales Only), PC A02/MF A01	DE83703412	MN -34D	8:50168
E-2-82-288	NTIS (US Sales Only), PC A02/MF A01	DE83702497	MN -34D	8:50219
E-2-82-413	NTIS (US Sales Only), PC A02/MF A01	DE83702243	MN -34D	8:50242
E-2-82-451	NTIS (US Sales Only), PC A02/MF A01	DE83702498	MN -34D	8:50351
E-2-82-595	NTIS (US Sales Only), PC A02/MF A01	DE83702499	MN -34D	8:50251
E-2-82-598	NTIS (US Sales Only), PC A02/MF A01	DE83702500	MN -34D	8:50220
E-4-82-306	NTIS (US Sales Only), PC A02/MF A01	DE83703418	MN -34C	8:50268
E-5-82-54	NTIS (US Sales Only), PC A02/MF A01	DE83702244	MN -34D	8:50369
E-17-82-585	NTIS (US Sales Only), PC A02/MF A01	DE83702496	MN -34D	8:50370
R-1-82-40	NTIS (US Sales Only), PC A02/MF A01	DE83702335	MN -37	8:49757
R-2-82-35	NTIS (US Sales Only), PC A02/MF A01	DE83702246	MN -34D	8:50243
R-2-82-74	NTIS (US Sales Only), PC A02/MF A01	DE83702312	MN -34B	8:49821
R-2-82-75	NTIS (US Sales Only), PC A02/MF A01	DE83702272	MN -34D	8:50187
R-2-82-80	NTIS (US Sales Only), PC A02/MF A01	DE83702273	MN -34D	8:50188
R-2-82-118	NTIS (US Sales Only), PC A02/MF A01	DE83702245	MN -34D	8:50352
R-2-82-528	NTIS (US Sales Only), PC A02/MF A01	DE83702501	MN -34D	8:50353
R-4-82-267	NTIS (US Sales Only), PC A02/MF A01	DE83702510	MN -34A	8:50150
R-4-82-603	NTIS (US Sales Only), PC A02/MF A01	DE83702502	MN -34D	8:50354
R-12-82-64	NTIS (US Sales Only), PC A02/MF A01	DE83702306	MN -4	8:49567
JINR-R-				
1-82-360	NTIS (US Sales Only), PC A02/MF A01	DE83703413	MN -34D	8:50169
3-81-828	NTIS (US Sales Only), PC A02/MF A01	DE83701469	MN -37	8:49758
4-82-740	NTIS (US Sales Only), PC A02/MF A01	DE83703419	MN -34C	8:50279
13-82-48	NTIS (US Sales Only), PC A02/MF A01	DE83701468	MN -37	8:49759
KFK-PFT-				
45	NTIS (US Sales Only), PC A18/MF A01; 1	DE83751104	MN -38	8:49631
KFK-tr-				
659	NTIS (US Sales Only), PC A02/MF A01	DE83780870	MN -04	8:49557
676	NTIS (US Sales Only), PC A04/MF A01	DE83780869	MN -79f	8:49026
677	NTIS (US Sales Only), PC A02/MF A01	DE83780868	MN -28	8:49723
686	NTIS (US Sales Only), PC A02/MF A01	DE83781078	MN -20	8:50419
KFKI-				
1982-80	NTIS (US Sales Only), PC A02/MF A01	DE83702256	MN -34A	8:49512
1982-86	NTIS (US Sales Only), PC A02/MF A01	DE83703404	MN -34D	8:50189
1982-87	NTIS (US Sales Only), PC A02/MF A01	DE83702257	MN -34A	8:49513
1982-99	NTIS (US Sales Only), PC A02/MF A01	DE83703405	MN -34D	8:50190
1982-110	NTIS (US Sales Only), PC A02/MF A01	DE83703403	MN -34D	8:50244
KHM-TR-				
41	NTIS (US Sales Only), PC A05/MF A01	DE83750988	MN -90a	8:48533
KU-HCOE-FL2-R-				
82-05	NTIS (US Sales Only), PC A02/MF A01	DE83702258	MN -34A	8:50151
82-06	NTIS (US Sales Only), PC A02/MF A01	DE83702259	MN -34A	8:49491
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9577-PR	NTIS, PC A05/MF A01; 1	DE83016352	STD -70	8:48669
9596-MS	*See* NUREG/CR-3355	DE83016528	MN -78	8:49197
9709-PR	NTIS, PC A10/MF A01; 1	DE83013358	STD -28	8:50260
9788-MS	NTIS, PC A03/MF A01; 1	DE83016353	STD -20g	8:50401
9797-PR	NTIS, PC A12/MF A01; 1	DE83016355	STD -4	8:49617
9809-MS	NTIS, PC A02/MF A01	DE83016356	STD -20f	8:50402
9837-MS	NTIS, PC A02/MF A01	DE83016357	STD -78	8:48999
9839-PR	NTIS, PC A02/MF A01	DE83016351	STD -33A	8:48761
LA-UR-				
83-963	NTIS, PC A02/MF A01; 1	DE83015240	MN -78	8:49186
83-1931	NTIS, PC A02/MF A01	DE83015254	MN -15	8:48670
83-2081	NTIS, PC A02/MF A01; 1	DE83015247	MN -34	8:49465
83-2138	NTIS, PC A02/MF A01	DE83015915	MN -45	8:49492
83-2162	NTIS MF A01; 2	DE83015642	MN -32	8:50245
83-2242	NTIS, PC A02/MF A01	DE83016274	MN -34	8:49514
LALP-				
83-25	NTIS, PC A02/MF A01	DE83016508	MN -78	8:49187
LBL-				
10070	NTIS MF A01; 2	DE83016916	STD -20g	8:50376
14175	NTIS, PC A02/MF A01	DE83015715	MN -25	8:49493
14517	NTIS, PC A02/MF A01; 1	DE83016606	MN -95d	8:49423
14574	NTIS, PC A03/MF A01	DE83015945	MN -11	8:49831

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14704	NTIS, PC A09/MF A01	DE83016320	MN -34A	8:49494
14788-Rev.	NTIS, PC A02/MF A01	DE83016108	MN -95d	8:49424
14959	NTIS, PC A02/MF A01; 1	DE83015992	MN -41	8:49832
15066	NTIS, PC A02/MF A01; 1	DE83015691	MN -20a	8:50403
15295	NTIS, PC A04/MF A01	DE83016416	STD -13	8:48774
15297	NTIS, PC A05/MF A01; 1	DE83015013	STD -95d	8:49425
15299	NTIS, PC A04/MF A01; 1	DE83011939	STD -95d	8:49426
15354	NTIS, PC A16/MF A01; 1	DE83015962	MN -4	8:49595
15376	NTIS, PC A03/MF A01; 1	DE83015936	MN -95d	8:49427
15410	NTIS, PC A02/MF A01	DE83015993	MN -25	8:49781
15828	NTIS, PC A02/MF A01	DE83015958	MN -4	8:49568
15838	NTIS, PC A03/MF A01	DE83016605	MN -34C	8:50299
15855	NTIS, PC A17/MF A01; 1	DE83016138	MN -34A	8:50152
15864	NTIS, PC A04/MF A01	DE83016682	MN -25	8:49495
15877	NTIS, PC A02/MF A01	DE83015951	MN -34C	8:50300
15894	NTIS, PC A03/MF A01; 1	DE83015996	MN -34C	8:50293
15987	NTIS, PC A04/MF A01; 1	DE83016470	MN -28	8:49719
16018	NTIS, PC A08/MF A01; 1	DE83016380	MN -91	8:48612
16024	NTIS, PC A02/MF A01	DE83016619	MN -25	8:49496
16079	NTIS, PC A02/MF A01; 1	DE83015997	MN -91	8:48618
16110	NTIS, PC A02/MF A01	DE83016002	MN -34C	8:50280
16116	NTIS, PC A07/MF A01; 1	DE83015944	MN -34D	8:50170
16126	NTIS, PC A02/MF A01	DE83015953	MN -95d	8:49428
16146	NTIS, PC A03/MF A01; 1	DE83016106	MN -34D	8:50171
16148	NTIS, PC A02/MF A01; 1	DE83016139	MN -34C	8:49720
16153	NTIS, PC A03/MF A01	DE83016656	MN -21	8:50404
16155	NTIS, PC A02/MF A01	DE83016112	MN -11	8:49822
16175	NTIS, PC A02/MF A01	DE83015955	MN -34C	8:50273
16214	NTIS, PC A09/MF A01; 1	DE83016471	MN -11	8:49853
16216	NTIS, PC A04/MF A01	DE83016693	MN -37	8:49552
16222	NTIS, PC A02/MF A01; 1	DE83016001	MN -20a	8:50405
16233	NTIS, PC A08/MF A01	DE83016319	MN -4	8:49497
16234	NTIS, PC A03/MF A01	DE83015935	MN -4	8:49553
16249	NTIS, PC A10/MF A01; 1	DE83016705	MN -34A	8:50294
16273	NTIS, PC A08/MF A01	DE83015963	MN -4	8:49584
16290	NTIS, PC A08/MF A01; 1	DE83015210	MN -25	8:49498
16297	NTIS, PC A03/MF A01; 1	DE83015524	MN -38	8:49638
16302	NTIS, PC A02/MF A01	DE83016190	MN -11	8:49823
16322	NTIS, PC A04/MF A01	DE83016617	MN -95d	8:49429
16327	NTIS, PC A02/MF A01; 1	DE83016620	MN -34D	8:50153
16341	NTIS, PC A06/MF A01	DE83016691	MN -48	8:49916
16372	NTIS, PC A02/MF A01; 1	DE83016622	MN -34C	8:50281
16386	NTIS, PC A02/MF A01	DE83015657	MN -92	8:49265
16437	NTIS, PC A02/MF A01	DE83016314	MN -28	8:49668
16441	NTIS, PC A04/MF A01	DE83016708	MN -4	8:49585
16469	NTIS, PC A02/MF A01; 1	DE83016315	MN -34C	8:50264
16502	NTIS, PC A02/MF A01; 1	DE83016318	MN -28	8:49669
16511	NTIS, PC A02/MF A01	DE83016603	MN -94cc	8:49224
LIS-				
21	Fachinformationszentrum Energie, Physik, Mathematik, Karlsruhe, Germany			8:50071
MERADCOM-				
2372	*See* AD-A-129083/2			8:48598
MESA-IR-				
1001	NTIS, PC A02/MF A01	DE83902980	MN -51	8:48626
1005	NTIS, PC A03/MF A01	DE83902976	MN -37	8:49760
1012	NTIS, PC A03/MF A01	DE83902987	MN -41	8:49646
1013	NTIS, PC A02/MF A01	DE83902961	MN -41	8:49833
1020	NTIS, PC A03/MF A01	DE83903047	MN -41	8:49845
1024	NTIS, PC A02/MF A01	DE83903043	MN -41	8:50076
1029	NTIS, PC A03/MF A01	DE83902970	MN -88	8:48585
1031	NTIS, PC A02/MF A01	DE83902968	MN -41	8:49649
1032	NTIS, PC A03/MF A01	DE83902967	MN -41	8:48586
1040	NTIS, PC A02/MF A01	DE83902993	MN -37	8:49806
1041	NTIS, PC A02/MF A01	DE83902992	MN -38	8:49807
1050	NTIS, PC A03/MF A01	DE83902999	MN -32	8:49650
1053	NTIS, PC A05/MF A01	DE83902996	MN -41	8:48553
1054	NTIS, PC A02/MF A01	DE83902974	MN -88	8:48554
1055	NTIS, PC A02/MF A01	DE83902973	MN -88	8:48555
1060	NTIS, PC A08/MF A01	DE83903033	MN -41	8:48589
1070	NTIS, PC A02/MF A01; 1	DE83902545	MN -41	8:49651
1073	NTIS, PC A02/MF A01	DE83903037	MN -37	8:49808
1086	NTIS, PC A05/MF A01; 1	DE83902782	MN -41	8:50077
1089	NTIS, PC A03/MF A01; 1	DE83902779	MN -41	8:50078
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84	*See* PB-83-205344			8:49572
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3085	NTIS, PC A05/MF A01; 1	DE83016647	STD -15	8:49569
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1093	NTIS, PC A02/MF A01	DE83902775	MN -88	8:48556
1099	NTIS, PC A02/MF A01	DE83902833	MN -41	8:49846
1100	NTIS, PC A02/MF A01	DE83902832	MN -41	8:49652
1105	NTIS, PC A02/MF A01; 1	DE83902841	MN -41	8:50079
1109	NTIS, PC A03/MF A01; 1	DE83902806	MN -88	8:48557
1110	NTIS, PC A02/MF A01	DE83902805	MN -88	8:48558

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1116	NTIS, PC A11/MF A01; 1	DE83902850	MN -41	8:50080
1117	NTIS, PC A02/MF A01	DE83902840	MN -41	8:50072
1118	NTIS, PC A02/MF A01	DE83902851	MN -88	8:48587
1119	NTIS, PC A04/MF A01	DE83902817	MN -41	8:50081
MT-				
260/ 75	*See* PB-83-197657			8:48927
MTR-				
81W275	*See* AD-A-126449/8			8:49445
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8317313	NTIS, PC A02/MF A01			8:50377
8317435	NTIS, PC A03/MF A01			8:50107
NASA-TM-				
77000	*See* N-8317313			8:50377
83444	*See* DOE/NASA/20320-47	DE83016423	STD -60	8:48945
84941	*See* N-8317435			8:50107
NBI-HE-				
82-42	NTIS (US Sales Only), PC A02/MF A01	DE83702247	MN -34D	8:50356
82-45	NTIS (US Sales Only), PC A02/MF A01	DE83702274	MN -34D	8:50191
82-47	NTIS (US Sales Only), PC A02/MF A01	DE83702248	MN -34D	8:50246
NBSIR-				
82/ 2474.	*See* PB-83-185348			8:49435
82/ 2483	*See* PB-83-185355			8:49436
83-2689	*See* PB-83-213470			8:48609
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1653	*See* AD-A-128773/9			8:48608
ND-R-				
467(S) Pt.2	NTIS (US Sales Only), PC A03/MF A01	DE83702518	MN -34A	8:50309
NIIAR-				
62(515)	NTIS (US Sales Only), PC A02/MF A01	DE83701470	MN -37	8:49809
NMERDI-				
2-67-2135	NTIS, PC A09/MF A01; 1	DE83016066	MN -66a	8:48924
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3750983	NTIS (US Sales Only), PC A04/MF A01	DE83750983	MN -97	8:49233
3770316	NTIS (US Sales Only), PC A02/MF A01	DE83770316	MN -13	8:49263
3770317	NTIS (US Sales Only), PC A03/MF A01	DE83770317	MN -95	8:49259
3770318	NTIS (US Sales Only), PC A05/MF A01	DE83770318	MN -97c	8:48957
3770319	NTIS (US Sales Only), PC A02/MF A01	DE83770319	MN -63	8:48836
3770320	NTIS (US Sales Only), PC A02/MF A01	DE83770320	MN -59	8:48909
3770321	NTIS (US Sales Only), PC A02/MF A01	DE83770321	MN -59	8:48910
3770323	NTIS (US Sales Only), PC A08/MF A01; 1	DE83770323	MN -38	8:49639
3770324	NTIS (US Sales Only), PC A09/MF A01; 1	DE83770324	MN -96	8:49449
3770325	NTIS (US Sales Only), PC A04/MF A01; 1	DE83770325	MN -25	8:49499
3770327	NTIS (US Sales Only), PC A08/MF A01; 1	DE83770327	MN -34	8:50438
3770328	NTIS (US Sales Only), PC A02/MF A01	DE83770328	MN -98F	8:48590
3770329	NTIS (US Sales Only), PC A06/MF A01; 1	DE83770329	MN -92	8:48593
NRL-MR-				
5029	*See* AD-A-127612/0			8:50389
5075	*See* AD-A-127791/2			8:49870
NRPB-IE-				
25	HMSO, London, price Pound 2.00			8:49773
26	HMSO, London, price Pound 2.00			8:49774
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134	NTIS (US Sales Only), PC A03/MF A01	DE83702313	MN -34B	8:49861
NUREG-				
0390-Vol.7-No.1	NTIS, PC A10/MF A01 - GPO	DE83902763	MN -80	8:48973
0430-Vol.3-No.2	NTIS, PC A02/MF A01 - GPO	DE83902768	MN -80	8:48746
0675-Suppl.No.18	NTIS, PC A10/MF A01 - GPO $6.50	DE83902764	MN -80	8:49188
0871-Vol.2-No.3	NTIS, PC A04/MF A01; 1 - GPO	DE83902761	MN -80	8:49042
0984	NTIS, PC A05/MF A01; 1 - GPO $4.50	DE83902771	MN -80	8:49189
NUREG/CP-				
0042	NTIS, PC A07/MF A01; 1 - GPO	DE83015000	MN -98F	8:49273
NUREG/CR-				
0130-Add.2	NTIS (US Sales Only), PC A03/MF A01 - GPO $3.75	DE83016660	MN -78	8:49043
2148-Add.	NTIS, PC A04/MF A01; 1 - GPO	DE83015852	MN -78	8:49190
2669	NTIS, PC A08/MF A01 - GPO	DE83016657	MN -80	8:48974
2874-Vol.4	NTIS, PC A02/MF A01 - GPO	DE83016221	MN -77	8:49191
3085/ 2-App.	NTIS, PC A18/MF A01; 1 - GPO	DE83016571	MN -78	8:49192
3111-Vol.1	NTIS, PC A09/MF A01 - GPO	DE83016862	MN -70	8:48671
3182	NTIS, PC A19/MF A01 - GPO $9.00	DE83902787	MN -80	8:49072
3214	NTIS, PC A16/MF A01 - GPO	DE83016631	MN -78	8:49193
3258	NTIS PC E05/MF A01 - GPO	DE83015851	MN -78	8:49194
3284	NTIS, PC A07/MF A01; 1 - GPO	DE83016858	MN -25	8:49632
3307-Vol.1	NTIS, PC A04/MF A01 - GPO $4.50	DE83016227	MN -80	8:49195
3329-1	NTIS, PC A05/MF A01; 1 - GPO	DE83016688	MN -78	8:49196
3331	NTIS, PC A09/MF A01; 1 - GPO	DE83016431	MN -80	8:49113
3336	NTIS, PC A03/MF A01; 1 - GPO $3.75	DE83902762	MN -80	8:49129
3355	NTIS, PC A05/MF A01; 1 - GPO	DE83016528	MN -78	8:49197
3394-Vol.1	NTIS, PC A10/MF A01; 1 - GPO $6.50	DE83016572	MN -78	8:49198
3394-Vol.2	NTIS, PC A99/MF A01; 1 - GPO $12.00	DE83016573	MN -78	8:49199
3398	NTIS, PC A04/MF A01; 1 - GPO	DE83016430	MN -70	8:48672
3410	NTIS, PC A12/MF A01; 1 - GPO	DE83016824	MN -32	8:49876
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211	NTIS, PC A04/MF A01	DE83016448	MN -2	8:49813
NYSERDA-				
83-6	NTIS, PC A04/MF A01	DE83015504	MN -66b	8:48925

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83-9	NTIS, PC A06/MF A01	DE83016689	MN -95d	8:49430
ONWI-				
139	NTIS, PC A03/MF A01	DE83016917	MN -70	8:48673
490	NTIS, PC A07/MF A01	DE83016811	MN -70	8:48674
ORAU/IEA-				
82-10(M)	NTIS, PC A07/MF A01; 1	DE83015728	MN -13	8:49834
ORNL-				
5980	NTIS, PC A06/MF A01; 1	DE83016459	MN -41	8:49998
ORNL/CON-				
125	NTIS, PC A05/MF A01; 1	DE83016344	MN -95	8:49431
ORNL/CSD-				
115	NTIS, PC A04/MF A01; 1	DE83016329	STD -32	8:49857
117	NTIS, PC A03/MF A01	DE83016343	STD -32	8:49500
118	NTIS, PC A06/MF A01	DE83016958	STD -32	8:50439
ORNL/PPA-				
83/ 4	NTIS, PC A03/MF A01	DE83016393	MN -41	8:50067
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9001/ 2	*See* NYSERDA-83-9	DE83016689	MN -95d	8:49430
ORNL/TM-				
8017	NTIS, PC A04/MF A01	DE83016392	MN -2	8:49867
8300	*See* NUREG/CR-2669	DE83016657	MN -80	8:48974
8443/ V4	*See* NUREG/CR-2874-Vol.4	DE83016221	MN -77	8:49191
8572	NTIS, PC A07/MF A01; 1	DE83016461	MN -48	8:50068
8671	NTIS, PC A05/MF A01; 1	DE83016959	STD -20f	8:50378
8692	*See* NUREG/CP-0042	DE83015000	MN -98F	8:49273
8752	NTIS, PC A03/MF A01	DE83016346	STD -20g	8:50379
8758	NTIS, PC A03/MF A01	DE83016458	STD -20	8:50380
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8781	*See* NUREG/CR-3331	DE83016431	MN -80	8:49113
8786	*See* NUREG/CR-3410	DE83016824	MN -32	8:49876
8791	NTIS, PC A02/MF A01	DE83016399	STD -20	8:50406
8801	*See* ORAU/IEA-82-10(M)	DE83015728	MN -13	8:49834
8810	NTIS, PC A03/MF A01	DE83016429	STD -4	8:49835
8822	*See* NUREG/CR-3398	DE83016430	MN -70	8:48672
8824	NTIS, PC A03/MF A01	DE83016347	MN -41	8:50034
8831	NTIS, PC A03/MF A01; 1	DE83016395	MN -13	8:49862
8832	NTIS, PC A02/MF A01	DE83016457	MN -41	8:50035
8834	NTIS, PC A02/MF A01	DE83016462	MN -80	8:49130
8836	NTIS, PC A06/MF A01	DE83016396	MN -90d	8:48517
ORO-				
3106-82	NTIS, PC A03/MF A01	DE83016175	MN -4	8:49601
4568-38	*See* DOE/EV/04568-38	DE83015027	MN -48	8:49993
OSM/TR-				
1-83	*See* ORNL/TM-8017	DE83016392	MN -2	8:49867
PATENTS-DE-	(German (F.R.): Deutsches Patentamt, Schriftenvertrieb, Gitschizer Str. 97-103, 1000 Berlin 60, F.R. Germany, DM 4.50- per copy, plus postage)			
3,002,828/ A/				8:48912
3,008,129/ A/				8:48918
PATENTS-US-	(US: Commissioner of Patents, Washington, D.C. 20231, USA, $1.00 per copy. Government Patent Applications available from NTIS)			
4,382,885				8:48633
A 6-440,728				8:49990
PB-				
83-149468	NTIS, PC A07/MF A01			8:49239
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83-175331	NTIS, PC A06/MF A01			8:49243
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83-185942	NTIS, PC A05/MF A01			8:49439
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83-191908	NTIS, PC A04/MF A01			8:48930
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83-192385	NTIS, PC A17/MF A01			8:49855
83-192955	NTIS, PC A04/MF A01			8:49877
83-192963	NTIS, PC A02/MF A01			8:49900
83-193615	NTIS, PC A06/MF A01			8:49240
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83-197095	NTIS, PC A02/MF A01			8:48560
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83-198887	NTIS, PC A05/MF E05			8:48838
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83-199331	NTIS PC E19/MF E19			8:49267
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83-200212	NTIS, PC A19/MF A01			8:48620
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83-200436	NTIS PC E08/MF E08			8:48643
83-200584	NTIS PC E08/MF E08			8:49596
83-200600	NTIS, PC A09/MF A01			8:48544
83-201285	NTIS PC E10/MF E01			8:49863
83-202010	NTIS, PC A04/MF A01			8:48577
83-203117	NTIS, PC A04/MF A01			8:50407
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83-203257	NTIS, PC A13/MF A01			8:48938
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83903001	*See* DOE/TIC-8200-R47	DE83007090	STD -80	8:48975
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83-7	*See* DOE/ET/51013-70	DE83016535	STD -20	8:50392
83-14	*See* DOE/ET/51013-94	DE83016533	STD -20	8:50372
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83-20	*See* DOE/ET/51013-91	DE83016646	STD -20b	8:50394
PINSTECH/HP-				
21	NTIS (US Sales Only), PC A02/MF A01	DE83702315	MN -48	8:50037
24	NTIS (US Sales Only), PC A02/MF A01	DE83702320	MN -41	8:49761
27	NTIS (US Sales Only), PC A02/MF A01	DE83702321	MN -41	8:49762
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90	*See* NVO-211	DE83016448	MN -2	8:49813

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PNL-				
4202-App.A-D	NTIS, PC A07/MF A01	DE83016661	MN -90d	8:48520
4403	NTIS, PC A05/MF A01; 1	DE83016641	MN -60	8:48947
4594	NTIS, PC A07/MF A01; 1	DE83016754	MN -61a	8:48778
4689	NTIS, PC A04/MF A01	DE83016918	MN -70	8:48679
4722	NTIS, PC A07/MF A01; 1	DE83016642	MN -70A	8:48680
4787	NTIS MF A01; 2	DE83016875	MN -11	8:49837
4797	NTIS, PC A03/MF A01	DE83016335	MN -11	8:49824
PNL-SA-				
9602	NTIS, PC A03/MF A01	DE83015430	MN -66g	8:48936
9787	NTIS, PC A05/MF A01	DE83016176	MN -70	8:48681
9942	NTIS, PC A02/MF A01	DE83014638	MN -48	8:50070
10913	NTIS, PC A02/MF A01	DE83016786	MN -70	8:48682
10976	NTIS, PC A02/MF A01	DE83016083	MN -70	8:48683
10977	NTIS, PC A02/MF A01	DE83016783	MN -95d	8:49442
11134	NTIS, PC A02/MF A01	DE83013827	MN -78	8:49200
11153	NTIS, PC A02/MF A01	DE83016086	MN -11	8:49073
11292	NTIS, PC A02/MF A01; 1	DE83016815	MN -25	8:49501
11391	NTIS, PC A02/MF A01	DE83016208	MN -98F	8:49236
11392	NTIS, PC A02/MF A01	DE83016245	MN -95d	8:49443
11419	NTIS, PC A02/MF A01	DE83013830	MN -48	8:50038
11430	NTIS, PC A03/MF A01	DE83016209	MN -98	8:49237
11551	NTIS, PC A03/MF A01	DE83016826	MN -11	8:49825
11559	NTIS, PC A02/MF A01	DE83016797	MN -94e	8:49217
PPPL-				
2011	NTIS, PC A02/MF A01	DE83016332	STD -20d	8:50408
2019	NTIS, PC A02/MF A01	DE83016333	STD -20f	8:50382
2023	NTIS, PC A02/MF A01; 1	DE83016331	STD -20g	8:50383
REC-ERC-				
82-21	*See* PB-83-192963			8:49900
RFP-Abst-				
08	NTIS, PC A02/MF A01; 1	DE83014110	MN -32	8:49642
RFP-Trans-				
409	NTIS, PC A03/MF A01; 1	DE83016805	MN -41	8:49878
RISLEY-Trans-				
4709	NTIS (US Sales Only), PC A05/MF A01	DE83902926	MN -71	8:48654
RISO-M-				
2322	NTIS (US Sales Only), PC A18/MF A01	DE83702415	MN -41	8:50315
2327	NTIS (US Sales Only), PC A06/MF A01	DE83702413	MN -41	8:49847
2362	NTIS (US Sales Only), PC A03/MF A01	DE83702353	MN -2	8:49252
2365	NTIS (US Sales Only), PC A03/MF A01	DE83702331	MN -80	8:49114
RISO-R-				
424	NTIS (US Sales Only), PC A07/MF A01	DE83702327	MN -38	8:49201
461	NTIS (US Sales Only), PC A10/MF A01	DE83702450	MN -2	8:50100
470	NTIS (US Sales Only), PC A04/MF A01	DE83702405	MN -48	8:49864
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IG	Inter-Governmental Maritime Consultative Organization
II	International Commission on Radiation Units and Measurements
IL	Israel

IN India
IO International Labor Organization
IP International Union of Pure and Applied Physics
IQ Iraq
IR Iran
IS Iceland
IT Italy
IX International Union of Pure and Applied Chemistry

JM Jamaica
JO Jordan
JP Japan

KE Kenya
KH Cambodia
KP Democratic People's Republic of Korea
KR Korea, Republic of
KW Kuwait

LA Laos
LB Lebanon
LI Liechtenstein
LK Sri Lanka
LR Liberia
LS Lesotho
LU Luxembourg
LY Libyan Arab Republic

MA Morocco
MC Monaco
MG Madagascar
ML Mali
MN Mongolia
MR Mauritania
MT Malta
MU Mauritius
MV Maldives
MW Malawi
MX Mexico
MY Malaysia

NE Niger
NG Nigeria
NI Nicaragua
NL Netherlands
NO Norway
NP Nepal
NR Nauru
NZ New Zealand

OE Organization for Economic Cooperation and Development
OM Oman

PA Panama
PE Peru
PG Papua New Guinea
PH Philippines
PK Pakistan
PL Poland
PR Puerto Rico
PT Portugal
PY Paraguay

QA Qatar

RH Southern Rhodesia
RO Romania
RW Rwanda

SA Saudi Arabia
SD Sudan
SE Sweden
SG Singapore
SK Sikkim
SL Sierra Leone
SM San Marino
SN Senegal
SO Somalia
SU Union of Soviet Socialist Republics (USSR)
SV El Salvador
SY Syria
SZ Swaziland

TC Trucial Oman
TD Chad
TG Togo
TH Thailand
TN Tunisia
TO Tonga
TR Turkey
TT Trinidad and Tobago
TW Taiwan
TZ United Republic of Tanzania

UA Ukrainian Soviet Socialist Republic (Ukrainian SSR)
UE United Nations Educational, Scientific and Cultural Organization
UF United Nations Children's Fund
UG Uganda
UI United Nations Industrial Development Organization
US United States of America (USA)
UY Uruguay

VA Holy See
VD Democratic Republic of Viet-Nam
VE Venezuela
VS Republic of Viet-Nam

WM World Meteorological Organization
WS Western Samoa

XA International Atomic Energy Agency (IAEA)
XC European Organization for Nuclear Research (CERN)
XE Commission of the European Communities (CEC)
XF Food and Agriculture Organization of the United Nations (FAO)
XJ Joint Institute for Nuclear Research (JINR)
XM Council for Mutual Economic Assistance (CMEA)
XN Nuclear Energy Agency of the OECD (NEA)
XO Organization of African Unity (OAU)
XR International Commission on Radiological Protection (ICRP)
XS International Organization for Standardization (ISO)
XU United Nations (UN)
XW World Health Organization (WHO)
XX World Energy Conference (WEC)

YD Democratic Yemen
YE Yemen
YU Yugoslavia

ZA South Africa
ZM Zambia
ZR Zaire

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